

3D WORLD

THE ONLY MAGAZINE FOR 3D ARTISTS



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THE MAKING OF VALIANT Can Vanguard's patriotic pigeons spearhead a new wave of British CG films?

PLUS Previews of the best new European 3D movies

AARDMAN SPEAKS

Learn to lip-sync 3D characters the Wallace and Gromit way: complete tutorial inside



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COVER ARTIST

Vanguard Animation

VALIANT, THE UK'S FIRST MAJOR CG ANIMATED MOVIE, tells the story of carrier pigeons in World War II. Start-up studio Vanguard Animation created the film on a strict \$40 million budget, which meant the team had to rely on off-the-shelf software solutions. As such, it's surprising to witness the level of detail invested in *Valiant's* birds. "In this movie, every single one of our main characters ended up a feathered, 'effects-based' character," says Buckley Collum, *Valiant's* co-Producer, in our feature on the making of the film, which starts on page 34.

A vast amount of time was also spent on the costumes, with *Maya's* Cloth Dynamics used extensively, while a *Maya* plug-in dubbed 'Chanko' was used to create the facial systems for the birds. However, despite such detailed characters, Collum maintains that the technology isn't the key part of the film. "Here the story is the most important thing," he says, "and we haven't tried to overly heighten anything that might detract from that."

Valiant is just one of a new wave of full-length European CG movies. You can find out more about these upcoming animations in the feature that starts on page 42. You can also check out the madcap French CG movie *The Magic Roundabout* in this month's Pre-viz section - turn to page 20 now!

[e] info@vanguardanimation.com

[w] www.vanguardanimation.com





the brits are coming!

034 Valiant, Vanguard Animation's WWII pigeon production, is the UK's first major all-CG movie. 3D World ventures bravely behind the lines...



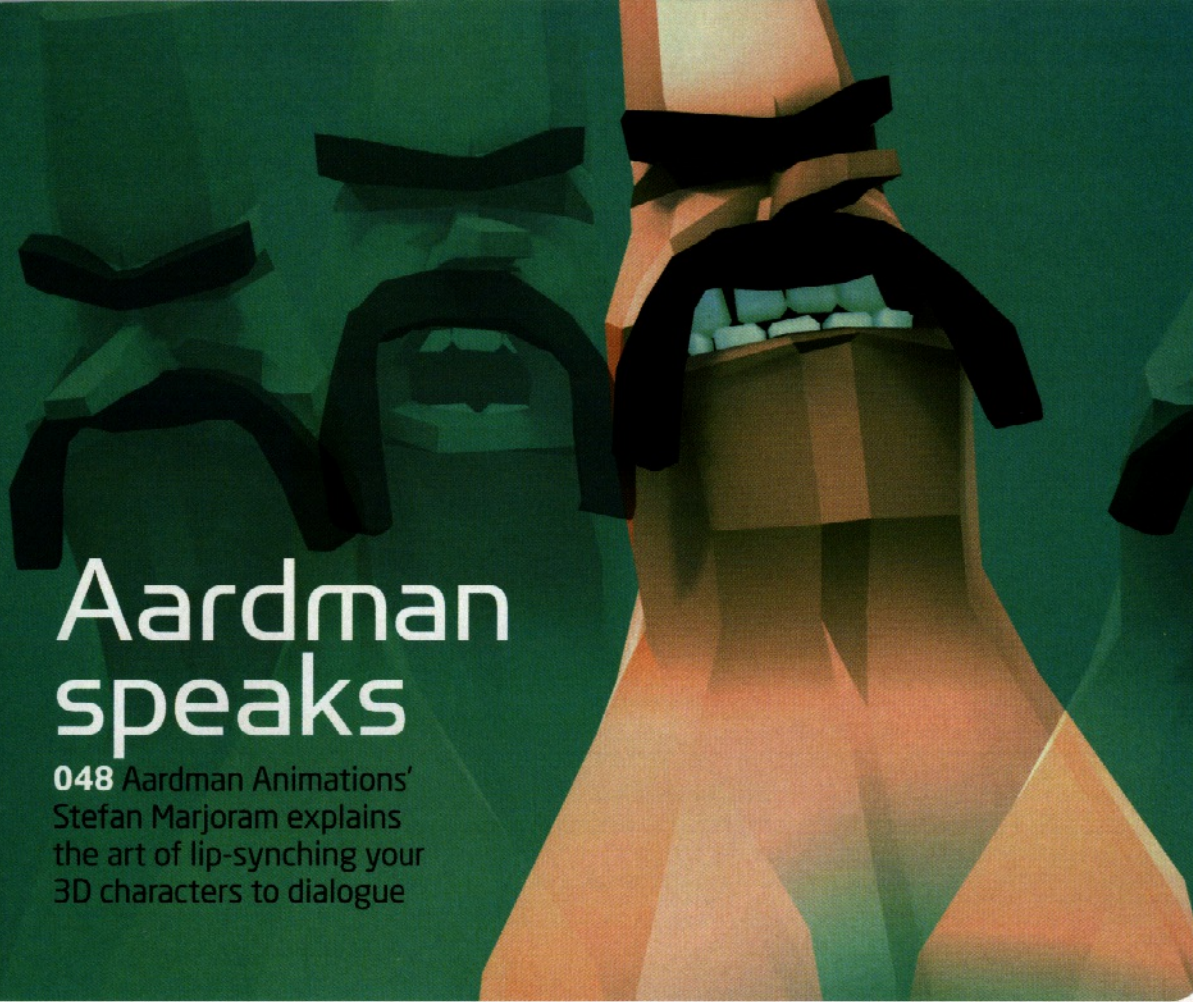
3D on the Mac: Is it a paper Tiger?

016 Has much changed in the four years since the new dawn of 3D on the Mac? 3D World investigates

EURO STARS

042 As more and more continental CG feature films go into production, we ask the directors about the trials and the benefits of doing 3D films the European way





Aardman speaks

048 Aardman Animations' Stefan Marjoram explains the art of lip-synching your 3D characters to dialogue

CONTENTS INDEX LISTING

- 016 PRE-VIZ**
Is Mac 3D making a comeback?
- 020 PRE-VIZ**
Ride the 3D *Magic Roundabout*
- 024 PROJECTS ROUND-UP**
The best new pro 3D work
- 026 3D WORLD INTERVIEW**
Stefan Fangmeier of ILM speaks
- 028 CLOSE UP**
The Hive's Kasabian promo
- 031 PRE-VIZ**
Letter from Hollywood
- 032 MENTAL ROY**
Too much of a good thing...
- 034 VALIANT**
Vanguard's CG pigeon capers
- 042 EURO STARS**
Europe's CG filmmakers speak
- 048 TUTORIAL**
Learn lip-sync the Aardman way
- 054 TUTORIAL**
Become conversant with *Mimic*
- 058 TIPS**
Expert character-rigging advice
- 062 TRADE SECRETS**
Rendering for print advertising
- 064 TUTORIAL**
Compositing using *After Effects*
- 070 FEATURE**
S.T.A.L.K.E.R. in our gaming sights
- 076 LEAD Q&A**
Animate tank tracks in *C4D*
- 080 QUICK QUESTIONS**
Your technical problems solved
- 088 GROUP TEST**
PCI-E cards vie for supremacy
- 094 REVIEW**
form•Z 5
- 096 REVIEW**
MatchMover Pro 3.1
- 097 REVIEW**
Primatte Keyer 1.6
- 098 REVIEW**
ThinkingParticles 2
- 099 REVIEW**
HyperMatter
- 100 3D TRAINING**
3D books and training DVDs
- 102 BUYERS' GUIDE**
3D software: prices and verdicts

Group test

REVIEWS Find out which PCI-E graphics card is top dog in our group test **088**



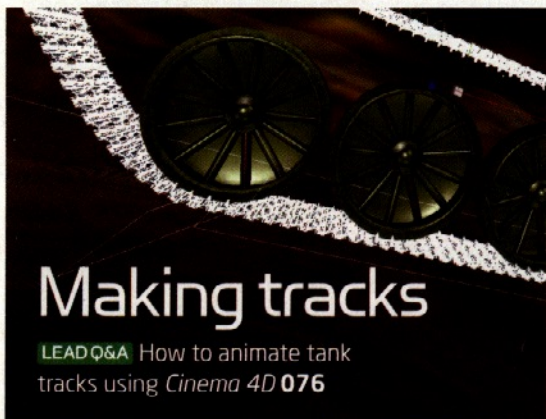
Rigging tips

TUTORIAL Rigging characters for animation the expert way **058**



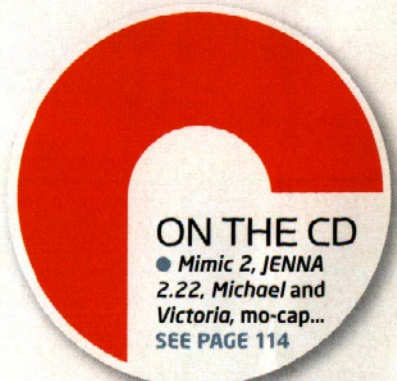
Making tracks

LEADQ&A How to animate tank tracks using *Cinema 4D* **076**



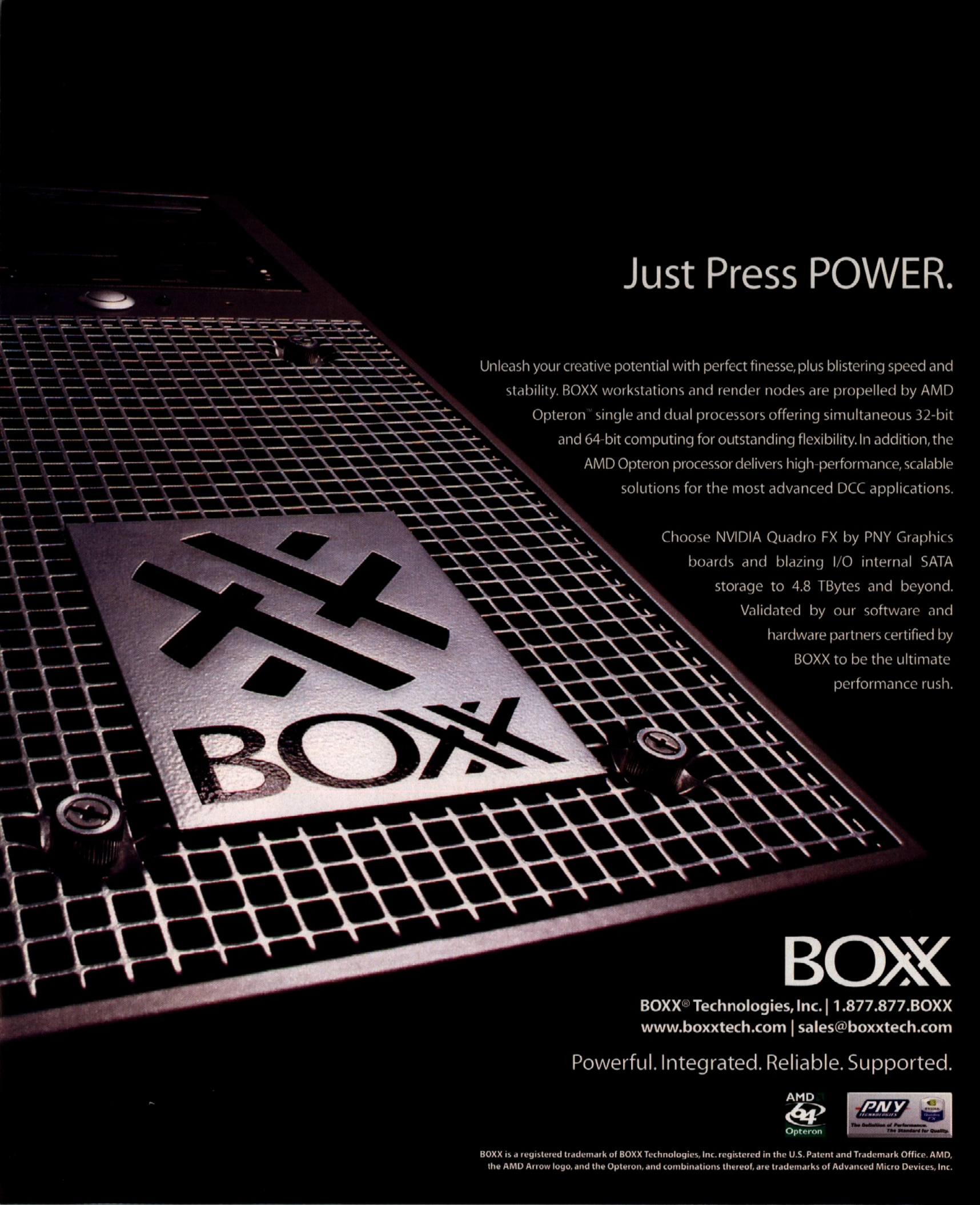
REGULARS

- 003 COVER ARTIST**
This issue: Vanguard Animation
- 007 EDITOR'S PERSPECTIVE**
Our view on this month's news
- 008 MAILBOX**
Your views on the 3D industry
- 010 EXHIBITION**
Get your own work into print
- 040 SUBSCRIBE**
Subscribe to the mag and save
- 046 SUBSCRIBE WORLDWIDE**
Discount deals outside the UK
- 068 COMPETITION**
Win a copy of *combustion 4*
- 087 NEXT ISSUE**
In the magazine next month
- 107 BACK ISSUES**
Missed an issue? Buy it here
- 108 CLASSIFIEDS**
New jobs and 3D services
- 111 BUSINESS END**
Legal and financial advice
- 113 INSPIRATIONS**
This issue: Syd Mead



ON THE CD

● *Mimic 2*, *JENNA 2.22*, *Michael and Victoria*, *mo-cap...*
SEE PAGE 114



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3D World is brought to you with the help and advice of leading 3D industry figures

SHELLEY PAGE



**European Representative,
DreamWorks Animation**

Shelley Page started her career in feature animation as Backgrounds Supervisor on Disney's *Who Framed Roger Rabbit?* She was one of the first artists hired to form DreamWorks Animation in 1995. She is now DreamWorks' European Representative resourcing new talent for the studio.
www.dreamworks.com

JORDI BARES



Senior 3D Animator, The Mill

Jordi Bares worked for eight years in the games and film industries in his native Spain, before moving to London in 2000, where he has also freelanced at Jim Henson's Creature Shop and Passion Pictures. The winner of many awards, he was nominated for an Emmy for his work on the BBC documentary *Pyramid*.
www.mill.co.uk

ANDREW DAFFY



CGI Supervisor, House of Curves

Andrew Daffy has worked in the CGI industry for ten years on projects that have accumulated over 30 awards. He was recently named one of Alias's *Mayo Masters* for 2004. His new company, The House of Curves, will act as both a studio and a training school.
www.thehouseofcurves.com

ALEX MORRIS



Director, Hayes Davidson

Alex Morris qualified as an architect in 1990 and joined architectural visualisation agency Hayes Davidson in 1996, having completed over 40 buildings across a number of sectors. He is responsible for many of HD's landmark images, including the UK's Millennium Dome, and the Tate Modern art gallery.
www.hayesdavidson.com

JOLYON WEBB



Principal Artist, Codemasters Software Company

Jolyon Webb moved into developing game art after years as a freelance illustrator. He works at leading videogame studio Codemasters as Principal Artist in the Central Technology Group: the company's internal research and development team.
www.codemasters.co.uk

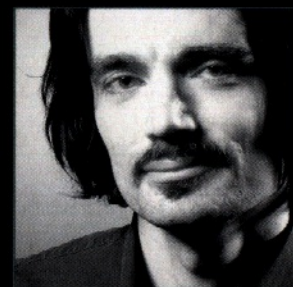
AARDMAN ANIMATIONS



Scott Pleydell-Pearce, Bobby Proctor and Stefan Marjoram

Respectively CGI Animation Head of Department, CGI Lighting/Technical Head of Department and a Creative Director for the commercials department, Scott, Bobby and Stefan have over 20 years' combined experience at Aardman, working on a range of award-winning ads, idents and short films.
www.aardman.com

Editor's perspective



There was a time in my life when I would never have considered going to the cinema if it wasn't to see a European film. When long-suffering friends did manage to drag me to see American movies, it was on the basis of guarantees – written, if necessary – that the film in question had either been made in the director's back bedroom, by Todd Haynes, or, in extreme cases, both.

I was, I admit, a dreadful snob, and I eventually grew out of it. But I did get to see some interesting films. Some were beautiful, some touching, and perhaps three or four changed the way I thought about the cinema forever. Of course, they weren't all works of genius: I also saw my fair share of costume dramas; Euro puddings candied with character actors; movies so turgid they could have been used as barrage balloons. There was, I grudgingly came to admit, a certain virtue in Hollywood's insistence on the necessity of a story arc, plot turning points, and a distinct beginning, middle and end to a film.

Flash forward ten years, and it's interesting to see the same debate being played out on a different stage. There are now, by our reckoning, at least ten European CG feature films due for release in 2005 or early 2006. The producers of those movies have all faced the same dilemma: do the benefits of the Hollywood model – pace, comprehensibility, an insistence upon the marketable – outweigh the opportunities created by making films in other ways? Essentially, are these Hollywood movies that happen to have been made outside of North America, or, as Onyx Productions' Aton Soumache puts it, "projects that take artistic chances that Disney would not dare risk in production"?

Of the movies featured in this issue of *3D World*, many fall into the first camp. But there are one or two projects in production – amongst them, Soumache's own *Renaissance* – that hint at a different way of doing things. For my own part, I hope to see more of them in future. Not because European films are inherently better, or worse, than Hollywood movies. But because they can, at best, offer the viewer a different way of thinking about the cinema. For years, Japanese animation has enjoyed a considerable cachet amongst 3D professionals, despite suffering many of the same disadvantages – minimal budgets, appalling distribution – as European film-making, and it would be nice to see some of that shine rubbing off on French, or Scandinavian, or British movies.

So would the projects now in production have satisfied the snob, my 21-year-old self? Probably not. He would have been content with nothing less than the works of Andrei Tarkovsky re-enacted entirely in 3D. As it happens, someone did do just that – although the company in question was not a film production house, but a Ukrainian games developer. But that, as you can discover by turning to page 70, is another story entirely...

JIM THACKER Editor
jim.thacker@futurenet.co.uk

3D WORLD SPEAKS

➤ Having been a reader of the magazine for quite a while, I still look forward to *3D World* each month. So I'm writing to ask you not to change a thing, except to add more to the magazine. Most of my time is spent in meetings or churning out computer images, so I find it difficult to really

spend time with every issue – having a one-year-old son doesn't help either! However, I do commute a distance to work that allows me time to think and reflect. I have found listening to stories on CD makes for a great ride. How unfortunate it is that I can't do the same for all my magazine subscriptions.

How difficult would it be for you to read out parts of the magazine from the CD you provide with every issue? An iPod with a microphone is all you need. How enjoyable it would be to listen to reports of new trends in the industry – or the news that *3ds max 7* will be offered to Mac users! [Steady – Ed.]

Mark Dzulbczynski
Industrial Designer

We have considered including audio interviews on the *3D World* CD in the past, and if this is something that enough people would be interested in, we'll look at it again. But do bear in

● The only tools required to record audio interviews for the *3D World* CD? If you'd like to see content of this type on the disc, write in and let us know your thoughts

Following the letter of the month from Chris Leighton in issue 60 [about 3D being too difficult and time-consuming to pursue as a career], I felt moved to write in and comment. Like Chris, I am a hobbyist who also does music, as well as being a volunteer/trustee for a wildlife sanctuary. All of which I juggle with a day job that leaves me little free time or energy.

Chris complains that he has yet to create an animal that looks right. Well, I have to say that maybe he is going about it the wrong way. The 3D community is a rare beast, allowing one to chat with industry giants and get their advice. Each will tell you that you must have sufficient reference material, and that you must understand how the creature you are building is 'constructed' in order to recreate it accurately. They will also happily tell you that they never stop learning – so if Chris is looking for an easy way to make money, he'd better give up right now, because this ain't it!

3D software in itself is not difficult. Sure, it has a learning curve, but if you can use the basic tools to create shapes, you need not use the high-end tools unless you have to. My first work looked little like what I was aiming for, but this was not the fault of *LightWave 3D*, my chosen package, being hard to use, or of it having too many features. Rather, it was an artistic problem: my lack of knowledge of how to construct what I wanted and to bring it to life. For someone with a traditional art background, the process should really be much easier.



● Issue 60: despite our letter of the month, in 3D there's no substitute for hard graft...

Instead of blaming the software for his inability to produce work, I think Chris has to question whether he has the drive to do so. Any medium in which you immerse yourself is time-consuming, and most people do 3D simply because they love it. It seems to me that Chris is looking for an easy way to make money without actually putting in too much time or effort – in which case, he will also be sorely disappointed if he goes down the music route. When I was in a local band, if we were not playing or rehearsing, we were still practising new material or recording. This took up most of our evenings, and some weekends, too.

Whether you favour 3D or any other creative medium, the accepted wisdom is: practise, practise, practise. Then, when you think you've finished, practise some more. There is no quick fix, not if you truly want to be good at something.

Colin Kai Heaps | Via email

The 3D community is certainly unique in its openness and willingness to educate aspiring artists, but there's no denying that to succeed in the industry, you have to be prepared to repay the hours that your peers are prepared to spend advising you. We hope that your Letter of the Month prize goes some way to making all of those hours of hard work seem worthwhile.

mind that we're journalists, not actors. Anyone expecting voice-overs of the quality of John Gielgud's is going to be in for a rude awakening...

TO CRASH, GET HASH

➤ I'm writing regarding your coverage of *Animation:Master* in issue 59.

After reading your glowing review, I decided that I would select *Animation:Master* to continue my hobby of 3D animation. What I quickly discovered, was you failed to mention that the program crashes *all the time* on both platforms. This is the most unstable commercial program I have ever used. Searching the internet more thoroughly, I have discovered that I am not alone. The money saved is not worth the loss of work and increase in frustration.

Scott Krieger | Westwood, MA, USA

We put Scott's comments to Shaun Freeman, our reviewer, who commented: "Since version 10.5, I haven't had stability problems with *Animation:Master*. Versions 9 and 9.5 were both shockers, but the software improved greatly with version 10, and

versions 10.5 and 11 have been rock-solid for me. I have always found the company's software support to be very good, so if you've been having problems, I would advise you to contact them directly."

THE NEW LOOK: GOOD

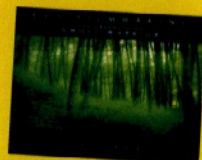
➤ I was on the verge of not renewing my subscription to *3D World*. I found the magazine was getting a bit tired, a bit *max*-centric, and that the individual tutorials were too short – but I think issue 62 has changed my mind. I love the new Q&A section, the lengthier tutorials and the reduction in the number of profiles. I like the new layout, filling up the pages with more information, rather than the usual single big image and three small paragraphs over two whole pages. (Less is more, except when more is more. In this case, more is more.) Really great new update.

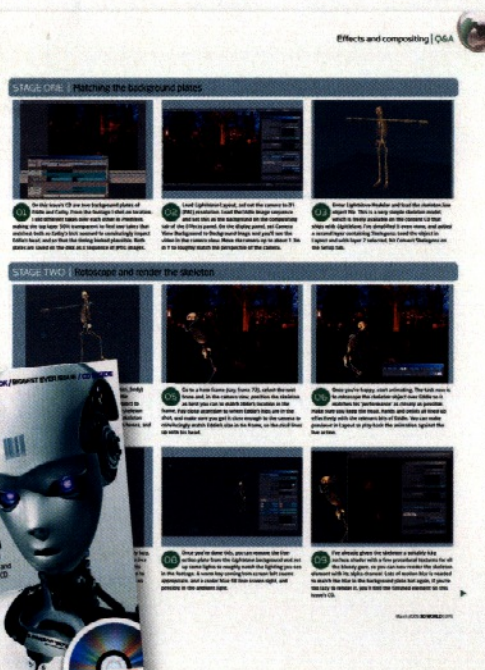
James Leaburn | Via the forum

➤ The new issue dropped onto my face this morning [Pardon? Ed] and I wanted to say well done. It looks fantastic, and the CD being inside is a

LETTER OF THE MONTH

Congratulations to Colin Kai Heaps, who wins *CGI Filmmaking: The Creation of Ghost Warrior* by Timothy Albee, published by Wordware Publishing. Part 'art of' and part 'how to', the book explores how one artist can create a feature-quality 22-minute animation in six months. We'll also throw in a DVD of the film itself, available via KURV studios. www.wordware.com, www.kurvstudios.com





stroke of genius, although the new pic of Mr Thacker means we can't tease him by saying he looks like George Michael. I'm sure the new look will go down well.

Larky | Via the forum

> [Regarding 3D World's new regular opinion columnist, Mental Roy] Hallelujah... at last someone telling it how it really is. It's like a breath of fresh air in a greasy, nerdy CG world. Nice one.

francomania | Via the forum

Thanks for all your feedback on the new-look 3D World. We've greatly appreciated all your postings - including one written entirely in verse, which you can read in the Mag Related section of the forum. As for not being able to tease 3D World editor Jim Thacker for looking like George Michael, if early comments are anything to go by, he is now being teased for looking like Charles Manson instead...

NO SERIAL NUMBERS?

> With the old-style magazine with a CD case, any serial numbers for software on the disc would be included with the case. Great: I don't need to dig around for the right issue to find the serial number. With the new look without the box, are the serial numbers going to be on the CD or in the magazine itself?

Dr Monkeyface | Via the forum

Both. If a product requires an installation code or online registration, we will include details on the CD contents pages and on the interface of the disc itself.

Based on previous feedback, we haven't set the interface to launch automatically on Macs, so you'll need to double-click either the 3DWorldClassic or 3DWIOSX icon once you've inserted the disc. If you're using a PC and the disc doesn't launch automatically, double-click 3dw.exe.

With the new design, all of the CD contents can be installed or opened via the interface, so the info should be right where you need it.

THE NEW LOOK: BAD

> I've literally just stepped through my front portal, having returned from my local magazine emporium brandishing the eagerly awaited, new-look 3D World. I have to say, I'm quite frankly bemused. I have been an avid reader of your mag for about two

● The new-look 3D World: overall, we think you like it - but please do continue to send us your feedback

years and have yet to miss an issue. But whilst flicking through issue 62 prior to purchasing it, my facial muscles visibly sagged, in concert with a subtle buckling of the knees. "What have they done to my beloved magazine?" I whimpered. I had to double-check to make sure I had not, in fact, accidentally grabbed a cheesy console-game mag aimed at pimply youths.

I have now thumbed through the new issue several times, and I'm relieved. The content is pretty much as before, which is a big thumbs up. The layout just looks a lot less slick than it once was.

I'm sorry if my complaint about the new look seems a bit petty, but remember, this letter is just a vehicle for my disappointment - which, I hope, will be running low on fuel by the time I start the excellent Pete Draper tornado extravaganza in the latest issue!

Danny McGrath | Eire

Again, thanks for all your feedback on the new design. This issue went to press too early to include any letters from overseas readers, but we'll be continuing to read through all your emails, and will be including more of your comments in future issues.

● Can't find the serial numbers? With the new-look 3D World CD, installation codes and registration links are now included on the disc interface itself



CONTACT 3D WORLD

3D World Magazine, Future Publishing
30 Monmouth Street, Bath, BA1 2BW
[t] +44 (0)1225 442244
[e] 3dworld@futurenet.co.uk
[w] www.3dworldmag.com

SUBSCRIPTIONS & BACK ISSUES

For subscriptions, back issues, or to place an order, please contact customerservice@futurenet.co.uk or call +44 (0) 1858 438 794

EDITORIAL

EDITOR **Jim Thacker** jim.thacker@futurenet.co.uk
ART EDITOR **Kai Wood** kai.wood@futurenet.co.uk
DEPUTY EDITOR **Owen Bailey** owen.bailey@futurenet.co.uk
PRODUCTION ASSISTANT **Sarah Rosenberg** sarah.rosenberg@futurenet.co.uk
SENIOR NEW MEDIA EDITOR **Matt Gallimore** matt.gallimore@futurenet.co.uk
ONLINE EDITOR **Jennifer Wagner** jennifer.wagner@futurenet.co.uk

WORD CONTRIBUTORS

Helen Arnold, Mat Broomfield, Evan Diner, Pete Draper, Rachel Elliott, Lance Evans, Mike de la Flor, Shaun Freeman, Mireille Frenette, Lee Gage, Lee Griggs, Benoit Guerville, Maggie Hohl, Steve Jarratt, Jon Jordan, Christopher Kenworthy, Bassam Kurdali, Andrew Lindsay, Stefan Marjomar, Ole Madsen, Gary Noden, Chris Ollis, Mark Ramshaw, Ed Ricketts, Barbara Robertson, Mental Roy, Jeff Smart, Benjamin Smith, Martin Southwood, William Vaughan, Adam Watkins, Craig Zerouni

ART CONTRIBUTORS

Louise Broom, Simon Cornish, GSC Game World, Christopher Kenworthy, Stefan Marjomar, Mark Mitchell, Colin Nightingale, Lee Griggs, Vanguard Animation

PRINTING

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ADVERTISING

ADVERTISING MANAGER **Rosa Smith** rosa.smith@futurenet.co.uk
KEY ACCOUNT MANAGER **Lee Haines** lee.haines@futurenet.co.uk
SENIOR SALES EXECUTIVE **George Lucas** george.lucas@futurenet.co.uk
CLASSIFIEDS **Rebecca Bell-Robinson** rebecca.bell-robinson@futurenet.co.uk

PRODUCTION

PRODUCTION MANAGER **Clare Touey** clare.touey@futurenet.co.uk
SENIOR PRODUCTION CO-ORDINATOR **Diane Ross** diane.ross@futurenet.co.uk
PRODUCTION CO-ORDINATOR **Mark Anson** mark.anson@futurenet.co.uk
COMMERCIAL PRINT BUYER **Mike Thorne** mike.thorne@futurenet.co.uk
ACQUISITIONS PRODUCT MANAGER **Julie Sewell** julie.sewell@futurenet.co.uk
AD PRODUCTION MANAGER **Nola Palmer** nola.palmer@futurenet.co.uk
CLIENT SERVICES EXECUTIVE **Emily Mounter** emily.mounter@futurenet.co.uk
COPYRIGHT CO-ORDINATOR **Sarah Williams** sarah.williams@futurenet.co.uk
CD-ROM PROJECT MANAGER **Robert Fluellen** robert.fluellen@futurenet.co.uk

MANAGEMENT

PUBLISHER **Kelley Corten** kelly.corten@futurenet.co.uk
PUBLISHING DIRECTOR **Dom Beaven** dom.beaven@futurenet.co.uk
MARKETING MANAGER **Fiona Tully** fiona.tully@futurenet.co.uk
GROUP SENIOR ART EDITOR **Paul McIntyre** paul.mcintyre@futurenet.co.uk
GROUP SENIOR EDITOR **Steve Jarratt** steve.jarratt@futurenet.co.uk
EDITORIAL DIRECTOR **Jim Douglas** jim.douglas@futurenet.co.uk
MANAGING DIRECTOR **Robert Price**
NON-EXECUTIVE CHAIRMAN **Roger Parry**
CHIEF EXECUTIVE **Greg Ingham**
GROUP FINANCE DIRECTOR **John Bowman**

INTERNATIONAL LICENSING

INTERNATIONAL LICENSING DIRECTOR
Simon Wear simon.wear@futurenet.co.uk
[t] +44 (0)1225 822798

DISTRIBUTION (UK)

Marketthorpe (UK) Ltd, 5th Floor, Low Rise Building, Kings Reach Tower, Stamford Street, London, SE1 9LS

SPECIAL THANKS THIS ISSUE

Simon Cornish, Rodney Midall, the new 'cola-style' drink from the vending machine



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IMAGE OF THE MONTH

Congratulations this month go to **Danny Falch**, who wins a copy of the *Extreme Hires HDRI Library*, worth \$119. This prize is supplied by ART VPS, creators of the powerful PURE hardware 3D rendering cards.
www.artvps.com



MATT MORRIS *The Other Side*
Softimage|XSI

"*The Other Side* tells the story of a man in a drab 2D world who is lured into a colourful 3D world by a beautiful siren. However, all is not as it seems... The film was completed as my MA project at Bournemouth Uni, gaining a distinction. It came second in the Softimage Student Contest 2004 and was included on the 2004 Shorts Drawer DVD by 3D Total."

[w] www.mattmos.com

DANNY FALCH *They Came From The Sea*
Autodesk VIZ 2005

"I've been doing 3D ever since 3D Studio 4. I started out doing architectural renderings for a living and sci-fi for fun. I started my own firm in 2000, called 3d-empire, doing mainly 3D illustrations and animations of architecture, but also websites, images, printed catalogues and design. *They Came From The Sea* was originally made for a contest at 3d-maxer.dk, which it won. All the modelling and rendering was done with Autodesk VIZ 2005."

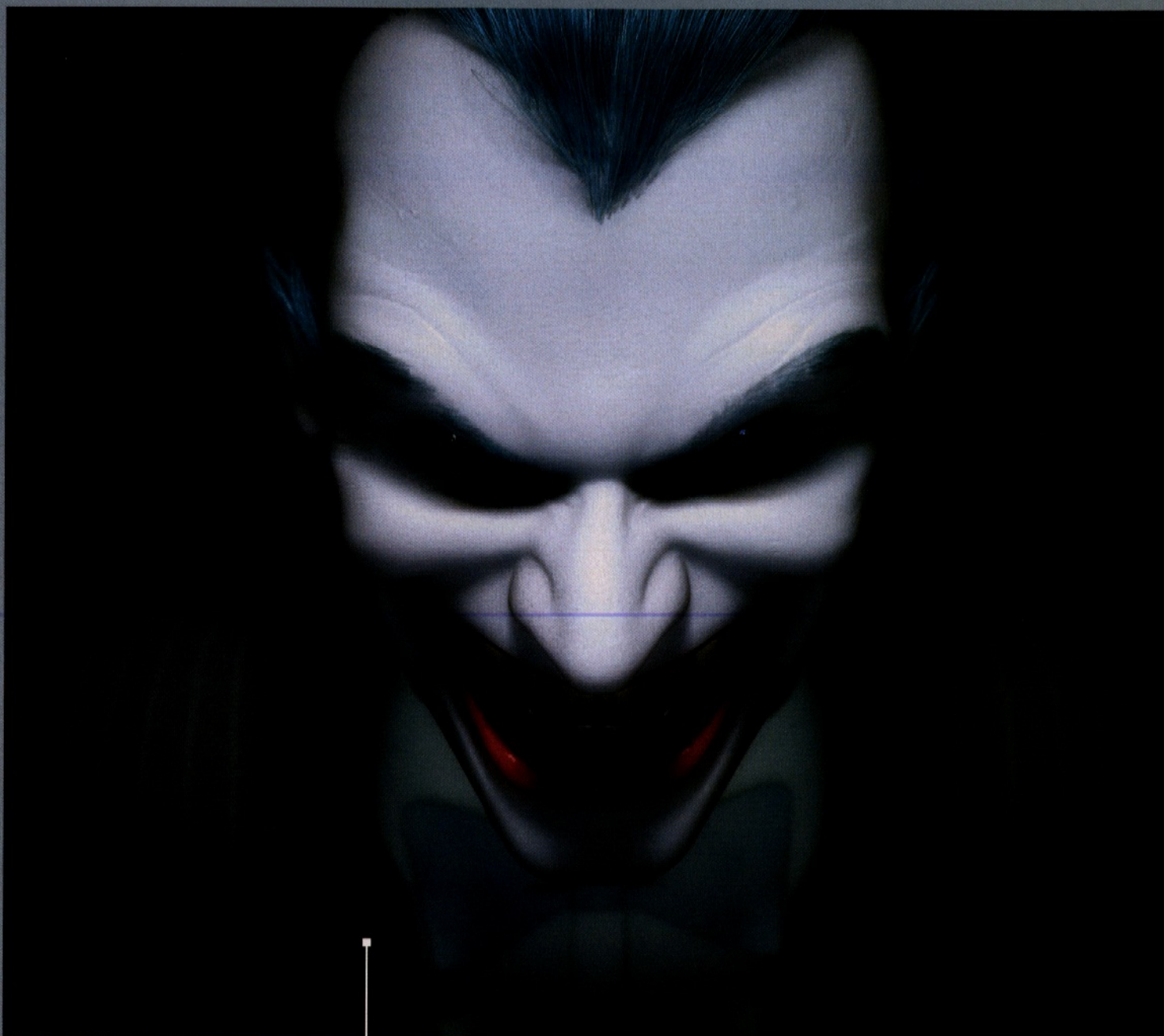
[w] www.3d-empire.dk





EXHIBITION

Send us your exhibition images | For postal address, see page 9



FILIPPE LOPES The Joker

Softimage|XSI 3.5.1, Photoshop CS

"I'm a 22-year-old self-taught artist from Brazil. I started out by working with web design and programming, but in 2003 I started to work with 3D animation for a company called Cia de Áudio, creating animations for DVD menus. I'm currently working in a post-production company called Tribbo Post (www.tribbo.com.br) doing 3D animation for a range of television commercials."

[e] filipe@3dinside.com.br

[w] www.3dinside.com.br/portifolio





CHRIS CHATTERTON BIO MONSTER
Cinema 4D, Photoshop

"I'm 22 years old and live in County Durham, England. I studied Graphic Design and Multimedia at college, which is when I caught the 3D bug. This image was created as part of a competition at renderosity.com. I currently work for an advertising agency, so 3D is still just a hobby at the minute. I have dreams of working as a character animator though."

[e] chris@rubber-chicken.co.uk

[w] www.rubber-chicken.co.uk

DAVE DAVIDSON
Pencil DOF
Cinema 4D XL v9

"I wanted to create an image that looked like it came from a stock photography library, hence the use of DOF. I'm a freelance 3D designer so I'm currently building up my portfolio with stock images that show people how they could use my services."

[w] www.max3d.org

ROWSBY Poised For Attack
LightWave, Sasquatch

"Quentin was meant to be a testbed model for developing new techniques and to test software. The pose is just a test of the rig, which can utilise motion capture data while allowing IK-ing. Most of my freelance work utilises *LightWave* and sometimes *Sasquatch* for textures, and I've worked for major studios such as Rhythm & Hues, Warner Bros. Feature Animation and Digital Domain."

[w] www.rowsby.com





JACOB SAARIAHO Demon Dawg
Cinema 4D

"I've always been fascinated by using different techniques to create an image. Pencil, paint, ink, computer... it's always fun to try a new medium. When it comes to 3D art, I find I'm more interested in creating characters that don't already exist than in reproducing objects that do. I get the biggest kick from pulling a personality out of a bunch of polygons."

[e] cptjack1@mac.com

[w] www.renderosity.com/homepage.ez?Who=CptJack

OTTO KOSZO High Rise - Pool
LightWave

"We create highly realistic architectural animations and rendering for architects, property developers and interior designers. We use *AutoCAD* and *APDesign* for the main modelling of buildings. We then import it into *LightWave* and add texturing, lighting, furniture and create video animations. We use *LightWave* because it's a complete package; it's easy to use and it renders beautifully."

[e] koscad3d@tpg.com.au

[w] www.renderosity.com/homepage.ez?Who=koscad

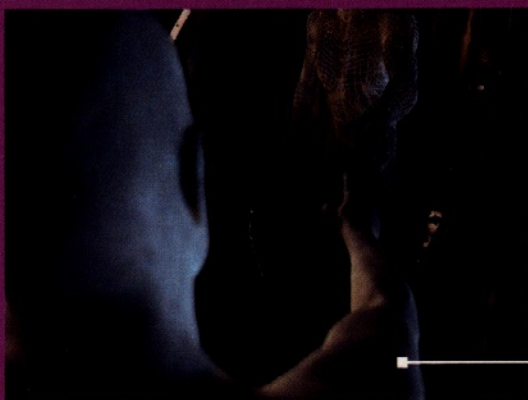


RUDOLF HERCZOG [ROCHR] The Race Bryce

"First of all, thanks to the Renderosity crew, who voted me Artist of the Year. This is a true honour. I've been drawing since childhood, mostly futuristic cities, characters and vehicles. A couple of years ago I discovered the world of 3D when I first tried Bryce. My favourite genre is sci-fi, and you can see more of my images on my new website at www.rochr.com."

[e] rochr@home.se

[w] www.renderosity.com/homepage.ez?who=Rochr



**MARTY KOLATOR
No Way Out, Who Am I?
Cinema 4D**

"I'm 18 years old and live in Prague, Czech Republic. I started with 3D graphics when I was 11 or 12. I've been using Cinema 4D for about two years and it's a brilliant piece of software. I love to do dark, surreal images with some kind of symbolism."

[e] mkolator@torioplus.cz

[w] www.renderosity.com/homepage.ez?who=linkinpark

Free online portfolio...

Become a member of Renderosity and you can set up your free online portfolio. Membership at Renderosity, the largest proven digital art community on the internet, is free and registration only takes a moment. Join the growing number of creative individuals that are networking and getting noticed by thousands of industry professionals and other artists. Membership also provides access to all of the software forums and tutorials, plus thousands of free items. To get more information and register for your free account, simply visit the website at: www.renderosity.com

Digital Art for the 21st Century

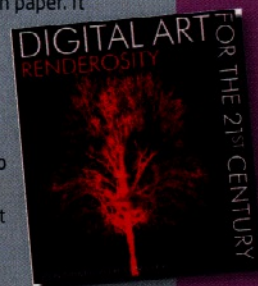
This stunning fine art book comes in a large 9-inch x 11-inch format, with 160 pages of beautiful art printed in full colour on lavish paper. It

features the works of 21 prominent digital artists.

This coffee table book also includes complete artist biographies, along with their personal

comments on each of their images. Get your copy of this highly acclaimed edition today! It's now available in bookstores or from the Renderosity Market Place at:

<http://market.renderosity.com/buybook>



CALLING ALL ARTISTS!

Would you like your work to be featured in the next *Digital Art* book from Renderosity and AAPPL? Then send in your submissions to be considered for inclusion! Entry is open to all digital art mediums. For more information, visit: www.renderosity.com/book
Closing date: 31 May 2005



PRE-VIZ

NEWS / OPINION / ANALYSIS



Is there a future for 3D on the Mac?

MARKET ANALYSIS Four years on from the launch of OS X, the Windows and Linux platforms still dominate high-end 3D. But can new developments in Apple's architecture tempt developers back onto the Mac?

Nearly four years ago, Apple introduced OS X for the Mac, amid much fanfare and hype about its future. The new UNIX-based system introduced system-wide benefits beyond the redesigned interface, such as modern memory management, and developers took to the new era with relish.

OS X helped to revitalise the Mac as a serious platform for all applications, not just *Photoshop*. Well, almost all. There's still one glaring gap in the market: heavyweight 3D applications. So where are they?

In the beginning, it looked as if the future would be bright for 3D on the Mac. Alias announced it would be porting *Maya* to the new system – and many pundits expected some other companies to follow suit. Indeed, there were strong rumours in 2001 that Apple was on the brink of buying a major 3D company to strengthen its portfolio, with Alias being touted as the favourite.

In the event, Apple didn't buy Alias. However, it *did* buy Nothing Real and the rather excellent *Shake*, but the buzz surrounding 3D seemed to die down as quickly as it had grown. Now, four years later, just 20 per cent of new *Maya* sales are for the Mac, according to Alias.

Yet if anything, the Mac has become an even more attractive platform for 3D. The G5 processor offers excellent 64-bit processing power, and forthcoming PowerPC chips seem set to reduce the speed gap with Intel processors. Mac OS X 10.4, aka Tiger, should add improved memory support, enhanced image

processing and other benefits. And the existence of the industry-standard *Shake*, together with its lower-end cousin *Motion*, makes the Mac ideal for compositing.

It was these benefits that tempted ART VPS to port its hardware-based raytracing system PURE to the Mac – that, and customer demand, as reported in issue 62: "We'd had, and continue to have, great success on the Windows platform," says Peter Taylor of ART VPS. "Then around six months ago, the number of enquiries about a Mac version began to skyrocket, so we decided to look into the possibility of porting the technology. We approached Apple with

our patented processor, and they were very interested in it. So basically it went from there."

He cites the G5's 64-bit capabilities as one of the Mac's attractions. "The PCI-X interface is also ideal for our needs, since the PURE chip sits on a PCI card in the Mac, so that extra speed is very useful. We like to see our

technology on all platforms – there's no reason that I can see why it shouldn't be available."

"MOST LARGER BUSINESSES HAVE A PROBLEM WITH APPLE: THEIR TOTAL SECRECY"

CRAIG ZEROUNI, SIDE EFFECTS

LACK OF I-DEMAND

There needs to be this demand for a Mac version to justify the costs involved in porting an established app. In the case of *Softimage|XSI*, there apparently isn't one: "We constantly evaluate the changing needs of our customers and monitor market trends closely," says Patrick Greene, European Business Manager at Softimage. "We're not seeing a huge demand for Mac support, but if and when that changes we will respond, as we did with Linux – when the market needed it, we delivered."

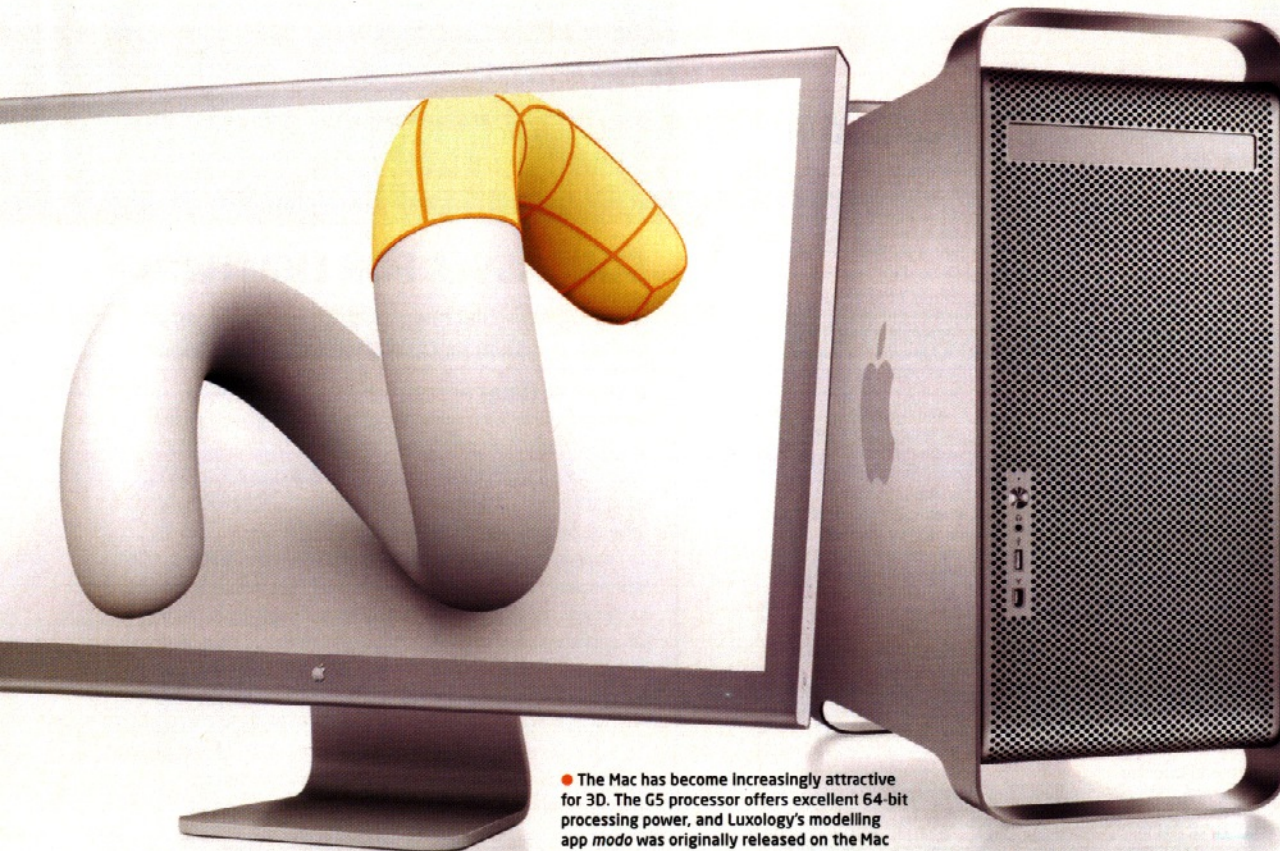
PLUGGED IN

MODO 102 SHIPS

Luxology has clearly not rested on its laurels since releasing version 1 of *modo*, its contender for the high-end 3D modelling crown. Version 102 features 300 enhancements, many of which are a direct result of customer feedback. These include improvements to *modo*'s modelling toolset, the addition of LUA scripting, and better *Maya* and *RenderMan* integration. *modo* 102 for PC and Mac costs \$895; free to registered users.

www.luxology.com





● The Mac has become increasingly attractive for 3D. The G5 processor offers excellent 64-bit processing power, and Luxology's modelling app *modo* was originally released on the Mac

TALKING POINT | Can Apple crack 3D?



"While there are small, hobbyist shops that are definitely interested in running their 3D applications on a Mac, most larger businesses have a problem with Apple: their total secrecy. It may be a great tactic to surprise consumers; businesses however, really really hate surprises. To convince people it's worth switching, Apple will need to be a lot more open, and a lot more specific about their future plans than they seem to have been so far."

Craig Zerouni
Production Consultant, Side Effects



"My first computer was a Mac, many moons ago. At the time I used *Photoshop* for work and did some early 2D animation in Director. But if I were starting out now in animation, I would buy a PC and *Maya*. They're good value, easy to use, and what the industry is using at the moment. Apple always seems incredibly inventive and I love the iPod and the design of their products, but somewhere along the way they missed a trick not getting into 3D software earlier."

Nick Mackie
Creative Director, Shufti



"It's very easy to develop 3D software on the Mac. We made the choice to use Apple's development tools from the very beginning. At first these tools were a little rough and our Mac engineers had to jump through some hoops to get everything to work. Over time Apple has really polished these tools nicely. Now the engineers that use PCs in our office are often jealous of the dev tools that the Mac folks use."

Brad Peebler
President, Luxology

Luxology's approach is to do away with the idea of platform development altogether. Although its modelling app, *modo* was originally launched on the Mac – contrary to most other apps – it's actually based on an independent architecture called OPAL: Operating System Abstraction Layer: "We maintain complete concurrency between platforms. We reduce development costs and time as well as having the ability to do system-specific optimisations," explains Brad Peebler, President of Luxology.

But it's not that simple for other developers, whose apps may be five or more years old. "All the monolithic 3D apps are based on old architectures and contain a mountain of old code," says Peebler. "To do a traditional port on a new platform would be costly... I don't think many major players want to spend additional money on development efforts." It's this, he says, rather than any lack of effort

on Apple's part to woo developers, which puts devs off. "The tricky bit is the economics – and that's beyond Apple's control. Recently, the trend has been for the 3D companies to downsize development efforts rather than expand them. There's also a marketing issue for Apple to overcome, but I think they're doing a good job in that arena – although their attention to the CG space comes and goes."

But even if such development was economically feasible, would there be a market for Mac 3D apps? Craig Zerouni of Side Effects is ambivalent: "Facilities probably don't care what hardware they run, as long as it's cost-effective," he says. "I know a facility that runs almost three-dozen Xserves because they want to use *Shake*, not because they think the Apple units look cool. *Motion* may similarly help motivate people to buy Apple hardware, which is what it was designed to do." ●

FEEDBACK

We want to hear from you on the issues affecting 3D artists, so from now on, once you've read our main news story on the facing page, why not visit our forum and post your reaction to it online?

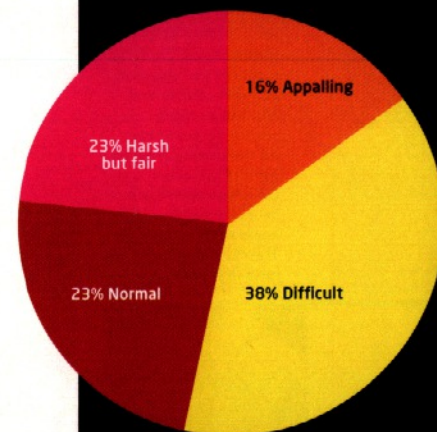
This issue's question concerns the mighty Apple, and its intentions for 3D on the Mac platform. As Tiger sharpens its claws five years on from OS X, is the Mac anything more than a fancy-looking toy, or is it evolving into a serious proposition for high-end 3D artists?

If there were a wider choice of high-end 3D apps on the Mac, would you consider switching?

- **Definitely** – the hardware's up to the job and the OS is better than Windows or Linux
- **Maybe** – if the price was reasonable and Apple stopped pretending they're rock stars
- **Only with new code** – if my app was redesigned specifically for the Mac rather than just being ported
- **Definitely not** – why shell out for a new system when the one I use works just fine?

LAST ISSUE: THE VERDICT

"What is the current state of play for a 3D artist at the average games developer?"



FormFonts

RESOURCE A new online database for 3D artists, and a fast way to access models



FORMFONTS IS A new subscription web service that provides unlimited access to a low-polygon 3D database for \$11 a month. CEO Fred Abler developed the site to further the evolution of

'expressive' (non-photorealistic, NPR) modelling.

Only a few years ago, modellers were at the perimeter of the design process. Today, tools like *SketchUp* are offering designers simple NPR that makes 3D more relevant to the design process. NPR allows designers to start with 3D geometry, then represent it graphically at various stages of the design pipeline. This greater penetration of 3D into traditional design may generate a demand for what Fred Abler refers to as "off-the-shelf" geometry.

FormFonts' database is created by a global team of 3D artists who add to it 24/7, often responding directly to subscribers' requests in a matter of hours. "I did this," Abler says, "because 3D modellers are replacing paper as a design medium. This is terribly exciting and I want to give everyone access to very low-polygon 3D models so they can design and iterate rapidly, without having to model every little thing. That's the concept. We're basically the Google of 3D models."

www.formfonts.com

PLUGGED IN

ROBOT VISIONS

Robots have taken a visually co-ordinated step closer to reality, with the culmination of Oxford Uni's research into Simultaneous Localisation And Mapping (SLAM). The SLAM system is able to work out in real-time where a camera is and how it is moving, constructing a detailed visual map of its surroundings. This enables computer graphics to be overlaid accurately onto live pictures as soon as they are produced, opening up a wealth of potential applications, including TV, video, interior design and navigation for domestic robots. Ask yourself – are you sure you really, honestly want a robot slave to perform all your menial chores and satisfy your every whim?

www.epsrc.ac.uk



SURPASSES FOR LIGHTWAVE

SOFTWARE The first integrated, interactive-layers rendering system for LightWave users is released

DEVELOPER LUKAS PAZERA has released *Surpasses*, an interactive render-pass management-system plug-in for *LightWave*. Described by its creator as "more than just a compositing tool", it allows users to modify and switch passes in OpenGL rendering, taking advantage of *FPrime*'s immediate feedback when used in conjunction with the Worley Labs plug-in.

Surpasses offers matte passes and precise control over individual lights in static scenes; but the program's real potential is revealed in its Dynamic Pass mode. Dynamic Passes are empty by default, so you can decide which scene items and properties to include or leave out – choosing from objects, lights, cameras and their properties, together with almost 40 scene properties, render channels and plug-ins.

The plug-in is for use with *LightWave* 7.5 and higher, and costs 85 Euros. It is currently PC-only, but an OS X version is in the works. Visit the site below for a product tour, and to download a demo.

<http://sps.polas.net/sps>

IN NUMBERS: GAME TOOLS

"23% of American VFX/animation studios are allocating more of their resources for game development tools."

Source: Trendwatch Visual Effects and Dynamic Media report, 2004 (www.trendwatch.com)

PLUGGED IN

BATTLE ANGEL

Director James Cameron is reportedly in pre-production on *Battle Angel*, a stereoscopic 3D film based on *Battle Angel Alita*, Yukito Kishiro's Manga series. The story is set in a technological post-apocalypse, and features a cyborg warrior girl searching for her identity. It will be a mix of live-action and CG – Alita herself will be a CG creation powered by an actress. The film is due for release in 2007.



© Yukito Kishiro

WEBSITE OF THE MONTH

www.etereaestudios.com

IF YOU'VE BEEN with us since issue 50, the name Cristóbal Vila may be familiar to you – he was one of the short filmmakers featured on our CD of the *Best Indie Animations 2000-2004*, contributing his mesmerising animated movie, *Snakes*.

Well he's back, with a new animated short, *Isfahan* – a film inspired by the architecture of the Iranian city of the same name. "I've loved Islamic art and architecture since my visit to La Alhambra in



Granada some years ago," says Cristóbal. "I like complex and graceful geometric patterns; I see Islamic architecture and ornamentation as a perfect mix of mathematics and art."

The most difficult task was the modelling and texturing work for the main dome sequence. "It's a complex and organic structure with lots of different pieces, curved in all directions," Cristóbal explains. Visit the site for making-of info, stills, and of course, the short film itself. ●

Further sites...

www.edge-online.co.uk

Edge magazine has at last resuscitated its website. Head over there for the latest morsels from the videogame world, and keep an eye out for the 3D jobs postings.

www.webmonkey.co.uk

Webmonkey claims to be the UK's only quality-assured directory of web professionals. Pay a visit if this is your line of work, or if your site needs a makeover.

A large, detailed illustration of Snake from Metal Gear Solid 3, wearing his signature camouflage and headband, holding a handgun. The background is a warm, orange-toned scene with silhouettes of trees and a smaller figure of Snake in the distance.

SOFTIMAGE | XSI

Do more for less.

"For the production of **METAL GEAR SOLID® 3**, we needed to produce more high quality data in a shorter time frame compared to **MGS 2**. **XSI** helped us achieve this by providing our creators with a better environment in which to concentrate on our production work. **XSI** is a superior tool for sure..."

**METAL GEAR SOLID 3:
SNAKE EATER**
Design Unit General Manager
Yutaka Negishi

Starting at **£299^{MSRP}**, **SOFTIMAGE | XSI** includes innovative character creation tools, unique real-time shaders, the fastest Subdivision Surfaces in the industry and integrations for core pipeline tools.

See **SOFTIMAGE | XSI** in action in San Francisco at GDC 2005: Avid Computer Graphics Booth 413. For more details, visit softimage.com/GDC05.

I am 4. the future of animation.

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softimage.com/games

Avid
computer graphics

● The Mister Blue Sky sequence of *The Magic Roundabout*, recreated in CG by French studio Action Synthèse



The Magic returns

NEWS FOCUS 3D World discovers the tasks faced by Action Synthèse in making the CG feature film *The Magic Roundabout* – the toughest being Dougla, who called for revolutionary hair dynamics

The words Brian, Ermintrude, Dylan, Dougla and Zebedee conjure up happy memories for many of us – happy memories of watching the rather surreal, spaced-out world of *The Magic Roundabout*. Originally a French children's TV programme created in the 1960s, the show was something of a masterpiece, a timeless classic – which posed an almighty challenge for the animation team at Action Synthèse when they decided to bring Dougla and his zany sidekicks back to life. The fruits of their long-term labour is called *The Magic Roundabout*, showing now in UK cinemas: an ambitious, full-length, 3D animated feature film, voiced by a host of international stars.

Development and pre-production on the film lasted for two years, during which time the team worked on character design and the general artistic direction. Although the studio used 3ds max for the movie's initial development, it eventually switched to Softimage|XSI, mainly for organisational reasons.

"3ds max is a great tool," explains Pascal Rodon, President of Action Synthèse, "but it's hard to build an effective pipeline on it for more than 10 or 12 workstations."

With the team ballooning up to 80 during heavy production, an effective solution was crucial. "We set up a partnership with HP and Softimage," says Rodon. "They helped us all along the way, with direct access to support and R&D."

One of the movie's greatest challenges was the character of Dougla. "These days everyone knows how to make hair," says Frédéric Bonometti, Animation Supervisor, "but Dougla's hair is very difficult: it doesn't grow from all over his body, but only from his spine. It also has to

follow Dougla's movements, and yet the little dog doesn't really have legs. We tried many different approaches to get the right effect. At the beginning, we had more than 1,500 mathematical expressions to drive the hair behaviour."

Eventually, Softimage helped the studio perfect an advanced inverse kinematics link technique that enabled animators to create curves driving the hair movement in real

"ACTION SYNTHÈSE IS THE TEMPLE OF KEYFRAME ANIMATION. NO MOTION CAPTURE WAS USED"

PASCAL RODON, PRESIDENT OF ACTION SYNTHÈSE



● Ermintrude the cow is voiced by Joanna Lumley in this CG remake of *The Magic Roundabout*



● Doug's hair was a rendering nightmare, although the original render time of four hours per frame was eventually brought down to around 45 minutes



● Working with young CG artists meant that senior members of the studio were often challenged by new ideas. One was to create bones in the shape of the characters to facilitate animation previewing

"WE CHALLENGED THE ORGANISATION OF THE PROJECT. THERE WERE MANY SMALL REVOLUTIONS IN THE WAY THE FILM WAS MADE"

FRÉDÉRIC BONOMETTI, ANIMATION SUPERVISOR

time. The studio also used a Spring tool to give the hair some flexibility. Since random movements were banned, all the hair animation was plotted. This technique also assisted the film's animation/rendering workflow: "We used two separate scenes for the same shot. The first contained all the animation components (flex, inverse kinematics and so on); in the second one, the character only had bones, envelopes and morphs. We plotted the entire animation in the first scene so that it could be rendered in the second," says Bonometti.

The rendering received particular attention. "You'll see that there are many many sets in the movie, and all of them are extremely rich," says Rodon. "We worked hard to achieve a unique rendering quality." A Canadian shader programmer worked extensively on new shaders and the whole rendering was done in *mental ray*. The result is gorgeous, with materials that are vivid and soft at the same time.

ROUNDAABOUT RESULT

For such a young studio, a feature-length version of *The Magic Roundabout* is quite an accomplishment. As Pascal Rodon says: "From the beginning, we tried to make it as good as *Toy Story*."

Despite being limited by a relatively small €20 million budget, *The Magic Roundabout* proves that Europe can face up to the Hollywood giants. Indeed, Miramax has already bought the distribution rights for the Americas and has ordered a sequel. A brand new TV series is also in the works.

The Magic Roundabout is showing in UK cinemas now. To view the trailer, visit the official website below. For more analysis of current European CG film-making, see page 42. [w] www.the-magic-roundabout.com

TALKING POINT | Two films for the price of one

Even with a relatively small budget, Action Synthèse chose to virtually produce two films. While the images are the same for the French and English-speaking versions, the dialogue is markedly different. Therefore, the studio did the lip-synch twice to match both languages. The reason for this is that the original French series was aimed at very young children, so the French film version is geared for that audience and retains a very poetic, childlike feel. The English-speaking version remains true to the British series, which was geared towards both adults (by adults, we mean students) and children, with more action and double entendres.



● A shot from *The Magic Roundabout* from storyboard to final render, via the animation rig and pre-viz of the layout. The entire process was completed in *Softimage|XSI*, with Softimage collaborating closely with the team

EVENT HORIZON

**GDC 2005, 7-11 MARCH, SAN FRANCISCO, USA**

It's almost time to jet out to San Francisco for the gaming world's prestigious get-together. Five days of games, technology, tutorials and speeches from industry stars await you; entry prices range from \$195 to \$1,975. www.gdconf.com

**ESCAPE STUDIOS AWARDS, DEADLINE 11 MARCH**

London training centre Escape Studios is about to close its Escape Awards competition, which offers work experience placements to winning entrants. Enter now for a chance to rub shoulders with the animation elite. www.escapestudios.co.uk/awards

**BRITISH TELEVISION ADVERTISING AWARDS, 9 MARCH, LONDON, UK**

If you're quick, there may still be time to book a place at the swanky British Television Advertising Awards, recognising outstanding examples from last year's commercials. www.btaa.co.uk

**ONEDOTZERO 9, 27 MAY-5 JUNE, LONDON, UK**

If the last eight are anything to go by, onedotzero's festival at the ICA should be well worth the entrance fee. Expect the usual celebration of the moving image, ranging from the exotic to the edgy and exceptional. www.onedotzero.com

Muted Maya upgrade

SOFTWARE There's seldom been such an underwhelmed response to a new upgrade of an industry standard 3D application. But are users giving version 6.5 of Maya a fair trial, or judging harshly?

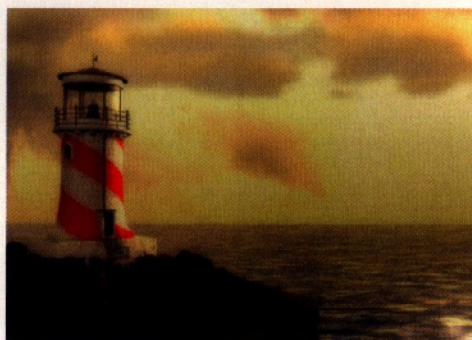
Alias has unveiled the latest version of its flagship 3D software, *Maya 6.5*, to a muted reception from its users. The company describes 6.5 as a 'performance-driven' release, focused on optimisation and the handling of large datasets to meet the demands of next-generation productions. There are new features, such as *mental ray* for *Maya* satellite-network rendering, but a perceived lack of innovation has led to some users grumbling that the upgrade is a disappointing one.

"The benefits of the release aren't easily communicated, so the initial lacklustre response was anticipated. As customers get their hands on *Maya 6.5*, and start pushing through the datasets this release was designed for, their feedback is consistently appreciative," said Bob Bennett, General Manager, Product Management at Alias. "Alias has focused on re-architecting the core of the software to prepare the application for the demands of next-generation productions. This was a bold decision by our development team. We want to be ahead of the technology curve for the benefit of our customers and what's coming for their pipelines in the next 18 months."

Bennett claims that games for next-gen consoles will see a 20-fold increase in the volume of data over that required for current titles, and predicts that users will begin to appreciate the stability of *Maya 6.5* as the "inevitable" rise in data size and complexity reaches their own workflow.

POLYGON IN 60 SECONDS

So, could the reason for all those underwhelmed forum postings really be that people have just heard "improved speed" too much from software developers? "The hi-tech industry at large is probably guilty of that," admits Bennett.



● Will version 6.5 of *Maya* sail by unnoticed? According to Alias, it will future-proof your 3D workflow for next-generation products

"Mileage will vary according to what you are doing with *Maya*." He offered examples of areas where performance has been made over 100 times faster by virtue of scaling with scene size, such as UV manipulations, Wrap Deformer, and Poly Commands on many components. Other areas where performance on some scenes has increased tenfold include Poly Mirror, Sculpt Deformer, saving *Maya* binary files over networks, loading .obj files and joints display.

"The fluid solver, particle sprite display, Artisan and 3D Paint are between two and ten times faster," Bennett added. "The key point, however, is that it's the accumulation of all the individual performance improvements that will really make a difference to the user's efficiency in *Maya 6.5*."

Prices for *Maya* remain the same: *Maya 6.5 Complete* costs £1,449 / \$1,999 / €2,099, while *Maya 6.5 Unlimited* costs £4,899 / \$6,999 / €7,349. Take a look at the full list of new features at the Alias website.

www.alias.com

Production line

The month's other releases in brief

**ALIENBRAIN 7.1**

Avid has announced a new point release of its asset-management software, *Alienbrain*. Improvements include better preview, help, search and remote collaboration functions. Avid has also released a plug-in for improved *3ds max* integration.

www.alienbrain.com

**BOXX 3200**

BOXX Technologies has added a new workstation to its product line, the BOXX 3200, which it classes as "the world's best-value

workstation". Shipping with an AMD64 processor, NVIDIA nForce4, dual PCIe x6 SLI with up to 4GB DDR-400, it costs \$1,698.

www.boxxtech.com

**VUE 5 INFINITE**

e-on Software's scenery-generation app, *Vue 5 Infinite*, will ship on 14 March. The new version for PC and Mac features 110 enhancements,

including new EcoSystem technology for populating scenes with millions of animated plants, rocks or objects. It will retail at \$599.

www.e-onsoftware.com

**KRAY**

Kray is a new Global Illumination renderer for *LightWave* from Polish developer MindBerries. The renderer is currently for

Windows only, and promises fast image-based lighting, efficient GI and sampling capabilities, and network rendering. It costs €294.

www.kraytracing.com



The future of 3D

FESTIVAL 3D World paid a visit to the b.TWEEN festival, to discover that it's keeping a beady eye on the weird and wonderful ways in which 3D could be implemented in the world of tomorrow

February's b.TWEEN Festival of Future Entertainment, held in South Yorkshire, revealed 3D installations never before seen in the UK. As well as showing stunning 3D imagery and artwork that was worth seeing in itself, it opened up some dramatic and intriguing vistas for the potential applications of 3D technology in future.

Aurora 2, by Brian McClave and George Millward, is the first ever 3D video of the Aurora Borealis. The duo have braved the ice and snow to simultaneously film the Aurora from three disparate vantage points, then created a large-scale projected art installation to immerse the viewer within this awe-inspiring phenomenon.

b.TWEEN also played host to *Intimate Transactions*, an interactive installation that allows two people in separate spaces to interact simultaneously using their bodies, in a form of futuristic frottage. Each participant uses a physical interface called Bodyshef, and by gently moving their bodies on this 'smart furniture' they instigate *Intimate Transactions*, which are then represented by 3D imagery. For more information on the festival, visit the URL below.

www.btween.co.uk



● McClave and Millward, all set to film the Aurora Borealis



● In the future, people could have 'Intimate Transactions' by rubbing themselves against 'smart furniture'...



IN NUMBERS: SALARIES

"Games developers typically earn 10-20% more than film/TV animators."

Source: Digital Vector Global Animation Industry: Strategies, Trends and Opportunities, 2005 (www.digital-vector.com)

i

"The SpaceBall creates an immersive experience. It feels like you are shaping your world rather than drawing it."

-Sefan Baier, Director of Production, Streamline Studios

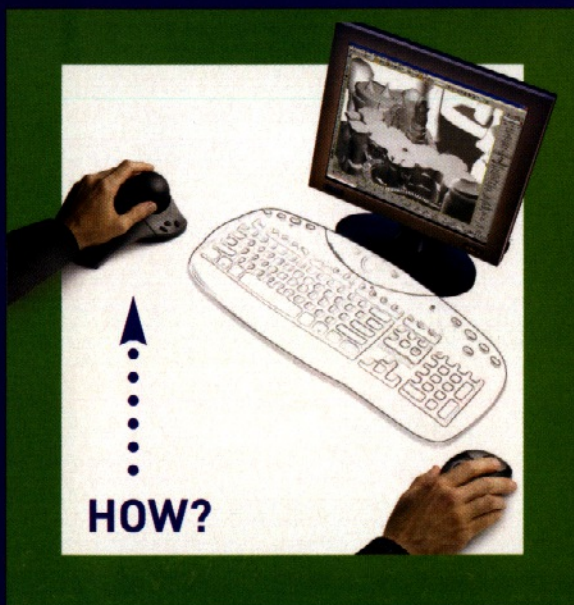


Image courtesy of Streamline Studios BV www.streamline-studio.com

Two Handed Power

Why do award-winning studios like Streamline Studios choose to use 3Dconnexion motion controllers? Used along with your standard mouse or stylus, a 3D controller makes you feel more connected to your CG models and scenes. Character modelling feels more like sculpting, scene and camera set-up become more interactive. Mouse movements go down and productivity goes up.

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3Dconnexion
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Projects round-up

This issue: racing tortoises, cows up trees and Charlie from Busted™

01 E4 REBRANDING

To refresh UK entertainment channel E4's on-air information, Precursor has created an 'E4 world' - a mid-programme 'brand space' of menus and stings with an illustrative style, complete with a 3D logo. "We deliberately designed [it] to have a very illustrative feel," explains Precursor founder Noah Harris. "We wanted a complete contrast with the squeaky-clean outside space; for the inside world to have a very fresh, off-the-cuff feel. But we also wanted to be able to take dynamic journeys through the space, so it was essential that we built the worlds in 3D."

www.precursorstudio.com

02 DIET COKE BILLBOARDS

Diet Coke gets a new CG mascot for its ads: Tort the tortoise. "The biggest challenge was the sequences for billboards in [London's] Piccadilly," says Mill 3D's Stephen Venning. "The site is wide and wrapped around a corner. We took digital stills of the site as pre-vis test material to ensure he [Tort] was visible from all angles. The Diet Coke brand 'ribbon' is also curved, so there was no real plain to ground the tortoise to. We had to build separate geometries alongside varying set-ups to create the illusion that Tort was rising in and out of perspective."

www.mill.co.uk

03 ANCHOR COMMERCIAL

'Anchor Cow' and 'Moo' explain the merits of Anchor Spreadable Butter in three new ads by Passion Pictures. "The live action was shot using a handheld camera, like a documentary," says Director and Animator Pierre Coffin. "CG characters were composited into the live action enable us to believe in them as real characters. The CG models were built and animated in Maya, and the animation was rendered and composited using French production studio Mac Guff Ligne's proprietary 3D renderer, and the Mac Guff proprietary compositor, Truktor."

www.passion-pictures.com

04 HECTOR'S LIFE AD

To advertise the Renault Espace, Framestore CFC created Hector: a paper figure who's escaped from a cartoon strip. "We put a 2D character into a 3D world," says Lead Animator Nicklas Andersson. "This required two separate rigs, a 2D one and a 3D one for when depth was required. Working in 2D denies you the sense of weight that you can create in 3D. It took six weeks working in Maya to bring Hector to life." The beetle Hector rides on is also CG creation, created in Maya using a real - and rather smelly - preserved beetle as a model.

www.framestore-cfc.com

05 FIGHTSTAR PROMO

Horsie, a directing team signed to White House Pictures, has created the promo for Palahniuk's *Laughter* - the debut single from Fightstar, fronted by ex-Busted singer Charlie Simpson. "We wanted to create a desolate ocean planet torn apart by fire and water," the team says. "It was shot in a specially constructed water tank, and shot on High Def using progressive scan to define and augment the water effects. For the fire, we used two plug-ins: *AfterBurn* for 3ds max and an in-development plug-in called *Aura* from Chaos Group."

www.whpictures.com







3DW: After your early career writing particle systems and space shuttle visualisations, you moved to mental images in 1989. What was your role? They made me Head Of Production, which basically meant when everybody else dropped dead, I was the one that had to finish every job. After less than a year and

a half, Nancy St. John called. She was at ILM. I landed in San Francisco on 15 November, 1990, and started working on *Terminator 2* on the 19th.

3DW: What did you do?

I came in as a TD and worked on the shot where the Terminator walks out of the flames, after the truck explodes, and transforms into the polyalloy look. I mapped different flame elements onto cards, animated the cards, and you could see the reflection on his body as he walked by. Before, reflections were always spherical systems. When I first came here, the polyalloy guy looked like he was wrapped in foil, so I worked with the shader and tweaked the material to give him more weight and not make it a perfect reflector.

3DW: Had you worked with shaders before?

Not really. But I loved the *RenderMan* shading language. I had a programming background, so the fact that I could go into the shader and change stuff was like heaven for me.

3DW: How did you know when you got it right?

The first moment of awareness came when I was working at Digital Productions. We got a CAD database of VW's new car, the Scirocco. They wanted to see if they could forgo building their foam model and go straight to a CG image of CAD data. When I got to the bumper I was thinking that I should know how a bumper looks. So the next morning, I started looking at bumpers. I remember doing the same thing for *Jurassic Park*. I stood in fields and looked at how much bounce light cows get on their bellies. I have no academic art training or film training really, but I realised that to become a visual artist you have to absorb what goes on around you and become analytical looking at these things.

3DW: When did you become a Visual Effects Supervisor?

I was promoted from TD to Sequence Supervisor to take over that final melting sequence for *Terminator*. It took seven months. After that I was CG supervisor on *Hook*. For that we did particle systems and set up a digital compositing department that worked on Macs.

And then Dennis [Muren] asked us if we could do dinosaurs. We had to develop a different texturing system and enveloping for *Jurassic Park*. When *Casper* started up, Dennis wanted me to work as the Digital Character Co-Supervisor. And, toward the end, Steven [Spielberg] asked Dennis if we could do tornados. Dennis asked me to take a look. *Twister* was my solo voyage.

3DW: You received your first Oscar nomination for *Twister*, and then *Perfect Storm* was your second. Was it more difficult?

I was used to fact that people would come to ILM and ask us to do things that haven't been done before. So when they asked, "Can you do water?" we said, "Yeah." But it wasn't like, "Let's do maybe a dozen shots of water in the background." It was the perfect storm. I don't think there's ever been a movie with that much water in it since. It was sort of a metaphor for what was going on my life because it was a time when my marriage was falling apart.

3DW: Have you ever wanted to work on an all-CG film?

About the time I was working on *Speed 2*, Jon de Bont was getting ready to do an all-CG film, but that didn't work out. And I talked with Steven Spielberg about doing an all-CG film when we were on the set of *Saving Private Ryan* that I would have directed, but it kind of blew up. There was also another small film that didn't get very far.

"FOR JURASSIC PARK. I STOOD IN FIELDS AND LOOKED AT HOW MUCH BOUNCE LIGHT COWS GET ON THEIR BELLIES."

STEFEN FANGMEIER, ILM VISUAL EFFECTS SUPERVISOR

3DW: But directing an all-CG film is no longer a passion?

It is a passion, but I think one step at a time. I wanted to direct all-CG films for a long time, but nothing happened. To make something happen you have to have momentum with you. So I figured the momentum to get is to go into live action and be successful and come back if you want. Maybe I will come back and do an all-CG, true live-action film. If you look at *The Matrix*, in some ways, that could have been a CG film. These things kind of cross over. There are different genres of films and films we haven't seen that could have been done that way. I never know what I'm going to do in three or four years. We'll see.

BIO BOX

Stefen Fangmeier has won three BATFA awards for Visual Effects (*The Perfect Storm*, *Saving Private Ryan*, and *Twister*) and three Oscar nominations (*Twister*, *The Perfect Storm*, and *Master and Commander: The Far Side of the World*).

Born in 1960 to German parents in El Paso, Texas, his family bounced back to Germany when he was six months old. When he was 16, his father, who was in the German Air Force, was assigned to a training program in America again.

At the end of three years, when the family packed to go home, Fangmeier decided to stay with family friends in Los Angeles. "That's where it started," he says. Fangmeier was soon attending college during the day and working for an aerospace corporation...

Stefen Fangmeier

Few 3D artists have as many strings to their bow as Oscar-nominated, BAFTA-winning ILM Visual Effects Supervisor Stefen Fangmeier. We caught up with him for an insight into his extremely varied career - from Space Shuttle visualisations to *Terminator 2*

BY BARBARA ROBERTSON

FANGMEIER'S FILMOGRAPHY

Lemony Snicket's A Series of Unfortunate Events, 2004
Master and Commander: The Far Side of the World, 2003
Dreamcatcher, 2003
Signs, 2002
The Bourne Identity, 2002
The Perfect Storm, 2000
Galaxy Quest, 1999
Saving Private Ryan, 1998
Small Soldiers, 1998
Speed 2: Cruise Control, 1997
Twister, 1996
Casper, 1995
Jurassic Park, 1993
Hook, 1991
Terminator 2: Judgment Day, 1991



● An early talent and love for programming has helped Stefen Fangmeier create classic visual effects for films like *Twister*, *Perfect Storm* and *Master & Commander*

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Kasabian 'Cutt Off'

Just when you thought it was safe to go back in the water, VTR's 3D department The Hive adds a bit of bite to the video of for gritty dance-rock act Kasabian

BY MARK RAMSHAW

DETAILS

TITLE

Kasabian *Cutt Off*

PRODUCTION

COMPANY

Cops and Robbers

DIRECTORS

Simon and Jon

RUNNING TIME

205 seconds

FIRST BROADCAST

January 2005

WEBSITE

www.vtr.co.uk

TEAM SIZE

Six (three in 3D)

TIME TAKEN

Four weeks

SOFTWARE USED

Maya, Shake, Inferno

They're the right band, in the right place, at the right time. So they also needed the right music video and, for Kasabian - the Brit outfit currently tipped as the next big thing - the right promo finds the band skulking their way through the streets of New York, a vicious Great White shark on hand to add a bit of excitement. This man-eating fish has the ability to fly around city blocks as smoothly as if underwater, and production company Cops And Robbers turned to VTR's effects facility, The Hive, to bring the animal to life.

"When they first came to us with a rough storyboard, we discussed the idea of using stock footage for most of the shots, making it more or less a 2D job supported by a small amount of 3D," says Christian Anderson, Senior *Maya* Animator on the project. "But it's very difficult to find good, clean, underwater footage, not to mention getting a uniform look. In the beginning we just didn't think it would be possible to do it with 3D. But through good planning, we were ultimately able to replace all the planned 2D shots." Even so, Anderson had just two weeks for all pre-planning, modelling, texturing and lighting work. "[Senior *Maya* Operator] Martin Allan and I then had nine days after receiving the live footage in which to complete all the animation," he adds.

James Allen was in charge of *flame* work and liaised with directors Simon [Willows] and Jon [Riche] for the video's live shoot. While there, he obtained all the necessary reference for the 3D work, including High Dynamic Range images, though Anderson ultimately decided they weren't necessary to the integration of the shark model. "I made use of HDR for the shot in which the shark eats a dog but, after that, I just worked with a GI dome instead. It was less hassle, and still looked good."

In addition to animation cues gleaned from footage supplied by the directors, Anderson also used the web to find all he could about Great White sharks. Particularly useful was data about the unique properties of the creature's mouth: "Humans' jaws move downwards while the skull remains rigid, but the shark's skull lifts so it can project its gums and teeth forward, to get an even better grip when it bites its prey,"

explains Anderson. "We deviated a little from realistic physiology; our creature is a bit bigger than the average shark - a little more like *Jaws*, I guess."

The reference material also revealed that the Great White shark isn't a particularly dynamic creature, other than during brief bursts of activity when attacking. Consequently, a few liberties were taken with the animation, while taking care to remain true to its general style of movement. "Often with a job the creature requires a long time to set up, and you don't have much time to work on the animation, but here the set-up was quite simple, so we could spend the time getting its motion looking really nice," says Anderson.

SHARK TRACKS

When it came to integrating the shark with the live shoot, Anderson opted to track manually. "There's one difficult 360-degree spin that I initially tried to track with *boujou*, but it was easier to do by eye. If the creature was in contact with the ground then it might have taken longer but, because the shark is floating, it doesn't have to sit so accurately in the scene."

Even the rendering was a simple affair. *Maya*'s own renderer was chosen rather than *mental ray*, in part because the extra power of the latter wasn't necessary, and in part so that The Hive's in-house render farm could be utilised - bringing render times down to less than a minute per frame. Even a caustic pass, added to enhance the shark's appearance, was ultimately dialled down - the directors deciding that too many underwater visual cues would be inappropriate. It's a combination of GI, careful animation and good compositing that makes the sight of a shark floating through the streets of New York so convincing: "The nature of the effect means people are obviously going to know it's fake, but I think it ultimately worked out well," says Anderson. "Even the directors were surprised by how much we achieved in the time available."

Kasabian's *Cutt Off* is out now. The video is currently playing on all major music channels. It can also be viewed at www.vtr.co.uk

FREEZE FRAME

The video opens on a desolate New York street, Kasabian's singer strutting his way down the block. The video alternates between shots of the singer and scenes of chaos, the latter seen from the viewpoint of whoever or whatever is causing people to run in fear. After numerous tease shots, a shark's shadow is finally seen passing over the cobbled road, and the shark itself glides into view, chasing a dozen people before smashing headlong into a car to attack its driver. The shark then eats a dog, fighting with its little old lady owner, and swoops down to grab one of the hapless pedestrians, tossing his body around. In the final frame the band stands looking moody, glancing at the shark as it swims by.





IN FOCUS | The technical secrets behind The Hive's very own Jaws



01

"The jaw was the most complex part, with a lot of skeletal detail around the mouth," says Christian Anderson. "We started with NURBS but ended up using polygons with Sub-Ds. We used expressions to get the bones opening up in a very specific way."

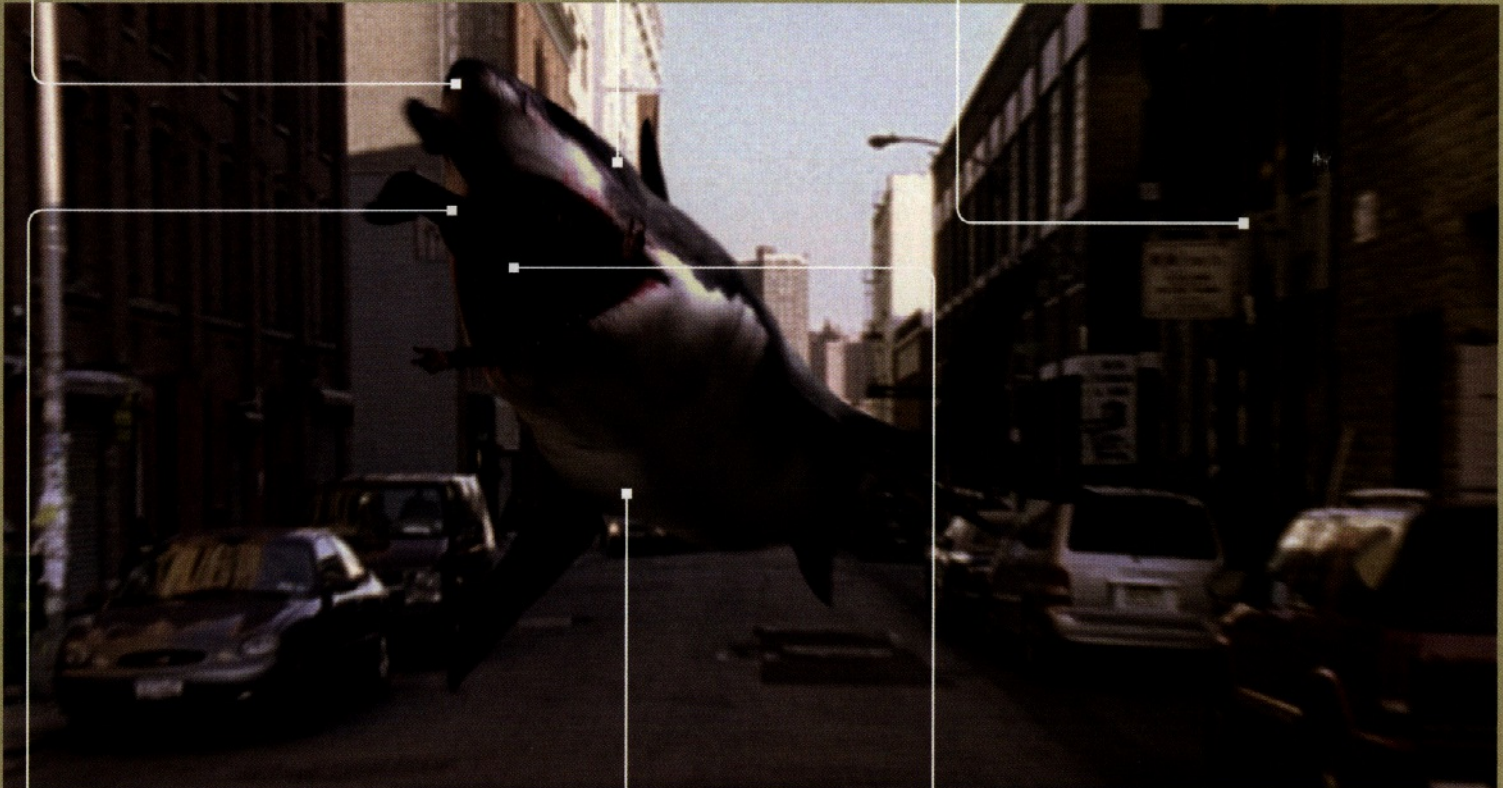
02

"If we'd worked with chromed objects then the High Dynamic Range data would have been an enormous help, but it didn't make much difference. [The shark] sits well in the scene thanks to a GI dome," says Christian Anderson.



03

"One of the directors stood on a ladder, jerking the end of a rope as much as he could, while the little lady held on to the other end," says Anderson. "I attached a chain to a reference point by her hands and another to the shark."



04

"We worked on two versions [of the video]. One for transmission before 9pm, where the shark chases a man. For the hardcore version we created a double for when the shark shakes him around and eats him," says Anderson.

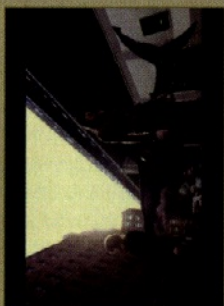
05

"The textures are taken from shark images that have been treated in Photoshop. I added quite a lot of scratches and battle scars. The directors wanted him looking quite gruesome and mean."



06

"We wanted the man's limbs to move oddly as he's jerked around, so we created a custom skeleton," says Anderson. "We then put together a crude 3D model, and laid digital images of a face and clothing onto it as simple textures."



Making 3D babies

● These two fetuses were animated by MillTV in *Maya*, with a vast collection of ultrasound scans used for inspiration

TV EFFECTS MillTV goes back to the womb for a new documentary



SIX MONTHS AGO, two members of MillTV were given a pile of medical books and told to go off and make babies. In spring, their creations will appear on TV in two documentaries that trace the development of a foetus, from fertilisation to birth.

The task was to produce and animate two 3D fetuses - one at month four and the other at month seven - which yawn, suck their thumbs, hiccup and kick. This is a science programme, so the models must be anatomically accurate.

"That was the key challenge," said Dave Throssell, Head of MillTV. "They had to look right and move right - to everyone. With something like a foetus, everyone thinks they know what it looks like, so we have to match their expectations, the medical references, the ultrasound scans we were using, and the physical live-action models you'll see, which were created by Artemis."

The other major challenge in this labour of love was the quantity of material. "Joel Meire did the animation in *Maya*, Nick Webber did the modelling and lighting, the rendering in *mental ray* and compositing in *Shake*. They produced 130 shots of two fetuses, each multi-layered for shadowing, depth of field and colour correction. There were 800 different passes composited together, and thousands of frames. The actual animation wasn't too hard - making them suck their thumbs and so on - but the trial was perfecting the shape of the muscles.

"It took six months to create something that looked human, and we began with nothing - you literally start with a cube, and work until it looks like a baby," explains Throssell.

The two documentaries will air internationally on the National Geographic Channel as *In The Womb*, and on Channel 4 in the UK as *Life Before Birth*.

[w] www.mill.co.uk

Animex 2005 report

SHOW REPORT Middlesbrough is fast becoming the place to be seen. No really, it is - at least for 3D artists

DISNEY LAYOFFS, *Star Wars* and the best new student animation shared starring roles at the recent Animex 2005 festival, held in Middlesbrough in the north of England. One of the UK's largest animation festivals, Animex showcases both CG and traditional work, including 2D and stop motion.

The week kicked off with Animex Game on the Monday and Tuesday, with influential speakers in the industry such as Ernest Adams. Wednesday's Animex Workshops saw the return of Ed Harriss (*XSI*), Pete Draper (*3ds max*), actor and animation guru Ed Hooks, and anatomy professor Stuart Sumida among others, followed by Animex Lounge which gave attendees the chance to chat with speakers over a beer or eight.

Thursday and Friday held the main event - Animex Talk! - with speakers such as Tom Martinek (ILM) giving a full history of ILM's work 'From *Star Wars* to *Star Wars*', Ed Harriss on breaking into the industry, and Mark Walsh and Robert Russ

(Pixar) presenting a breakdown of the animation skills and tools used at Pixar in several of their movies. Throughout the week, several animation shorts and documentaries were showcased at Animex Screen, including Curtis Jobling's latest work, and an insight into the Disney layoffs with Dan Lund and Tony West's *Dream on Silly Dreamer*.

"We couldn't have wished for a better week," says Chris Williams, Festival Director. "We hosted our first World Premiere, screened more than 140 films, presented speakers from the biggest and best studios from around the world to a sell-out audience, screened our own commissioned films and presented awards to the best student animation in the world, shortlisted from 450 entries. It was hard work and a huge team effort but, judging by the feedback, we've had it was well worth it!" You can see the winning work at the website below.

[w] www.animex.net



© Supinfocom



© Johan Borgstrom

● Winners of the Animex 2005 Student Animation Awards: above, *Overtime* by Oury Atian, Thibaut Berland and Damien Ferrie; below, Johan Borgstrom's *Eon - Chapter One*



Letter from Hollywood



In 2002, Apple Computer bought Nothing Real (creators of *Shake*) and Silicon Grail (creators of *Chalice* and *Rayz*) and effectively took control of the market for compositing software. There were (and are) other choices of software for compositing, but not many, and

especially not at the high end of the market. So Apple rides into the sunset, game over, roll credits. Right? Not so fast.

Apple continued to sell *Shake* on Linux, although it costs twice as much as it does if you want to run it on Apple hardware. Meanwhile, it took some of the DNA from *Rayz* and created *Motion*, a slick piece of \$300 software that ought to sell a lot of Apple hardware all by itself.

Meanwhile, Digital Domain announced that it would sell *Nuke*, its in-house compositor, to anyone who was interested. At the time, I don't think a lot of people took it seriously. Many felt that, as an effects facility, it wouldn't have the focus, or the resources, to do what it takes to package up and sell, let alone support, software.

But Digital Domain have kept at it, and by the time you read this, it'll have two good-sized sales of *Nuke* to announce. The dynamics of the compositing market continue to change. In fact, the dynamics have become especially interesting lately.

Consider: you're a medium or large-sized effects company, and you need a couple of dozen seats, or more, of compositing. What

Shake rattle and roll

Can Digital Domain nuke Apple out of the compositing market, asks **Craig Zerouni**, Production Consultant at Side Effects Software - or does the future belong to open-source tools?

do you do? Well, you could buy *Shake*, which would do the job, but then you'd be relying on Apple. For almost all high-end shops, Linux is now the OS of choice. Apple will sell you *Shake* on Linux, but for how long? Six months? A year? Forever? Nobody knows. The last thing you want is to spend a lot of time and money, then find out nine months later that the product has been discontinued on Linux.

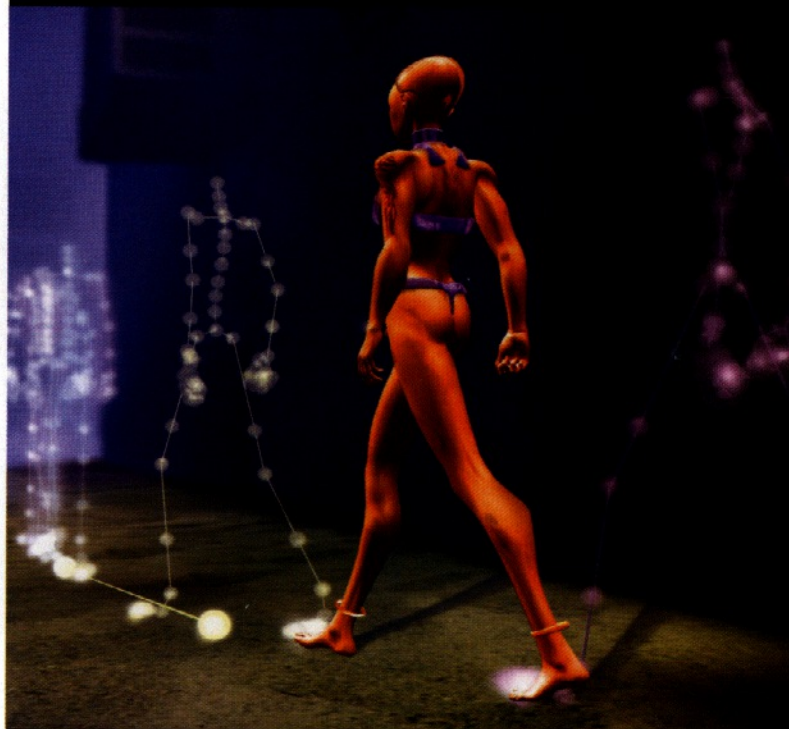
But that leaves you with the other serious choice, *Nuke*. And *Nuke* isn't an easy sell either. For one thing, it's even more expensive than *Shake*. For another, it means you're not just giving money to a competitor, you're also relying on them for support. You wouldn't be doing your job properly if you didn't wonder, just for a moment, what would happen if you needed some emergency fixes to *Nuke* at the same time as a similar crisis hit Digital Domain. I'm sure they'd do everything to assist, but the situation could lead to a conflict of interest for them.

But after all this time, compositing remains something that's both vital to feature effects production and not a viable standalone business. From *Cineon* to *Chalice* to *Shake*, there continue to be people writing good-quality compositing systems who can't build a sustainable business out of it - even though everyone has to have it. I can't explain why this should be.

Perhaps the imminent success of *Nuke* points to something else. Maybe film effects folk will have to rely on each other for the tools to do the job. Maybe this business just isn't business enough to support a third-party solution for this problem. If that's true, I can think of two words that might describe the long-term future of this software. Two words that solve the problem once and for all: Open Source.

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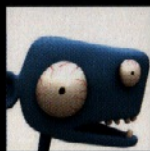
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MeNTaL RoY

Living out of a vending machine on his latest 3D all-nighter, resident columnist **Mental Roy** argues that 3D artists have a duty to foster the imaginations of the young, rather than filling their television screens with lacklustre, dialled-in CG...

**CHILDREN
SEE SO MUCH
CG, THEY'VE
BECOME BORED
WITH REAL LIFE**



IT MIGHT BE because my shifts last seventy-two hours. It might be the fact [that I've only had five fruit Toffos and a Pepperami to eat in the last 48 of them. But I'm beginning to see CG EVERYWHERE. And I also swear that, despite my impaired judgement, the more of it there is out there, the more dangerously ordinary it begins to look.

When I grew up, animation meant *Ivor the Engine* (which, for the uninitiated, was about a steam train in Wales with a dragon onboard), *Charlton and the Wheelies* (about a casual Northerner protecting some skateboards from a witch who lived in a kettle), and *Mr Benn* (about a clothes shop that rather impractically opted for a teleportation device instead of a men's changing room). The point is, when you were a kid back then, there was never any danger of mixing up make believe and real-life - unless you happened to take a lot of drugs, which everyone in the '70s did, of course; just not when they were children, unlike today.

And yet there's no wonder children today turn to drugs, alcohol, and alas - sometimes even to Burberry. They're exposed to so much CG, they've actually become *bored all the time*; and what's worse is they're becoming immune to it. I mean it must come as a serious let-down to today's children that they don't at the very least have mutant superpowers, that they can't perform

impossible dance moves, that they can't instantly bend it like Beckham, use their special moves in playground fights, turn invisible, that they can't... JUST BLOW STUFF UP simply by looking at it. Real life just can't measure up; and before you can say ADHD, they're out there, breaking into your car, brains full of heroin.

So think of the children. Use CG to develop their imagination, not replace it. Otherwise, the impressionable mind will end up being unimpressable. *Then* what are you going to show them? There is such a thing as too much of a good thing. And yet, nine out of ten adverts ritually make extensive use of CG - and often, it's just there for the sake of it; easy, uninspired, designed-by-committee stuff that may impress the producers, but it ain't fooling the kids. Nosiree. They know lazy 3D when they see it.

And where does the CG crusade end? Is *EastEnders* next on the list for a 3D makeover? "Nah, don't bother with a canine actor - too expensive. We'll do a CGI Roly... just because we can. In fact, while we're at it, let's replace the dog with a giant squid and superimpose Arthur Fowler's face on it! Someone 'phone up Weta for a troll model - Sharon's back in next week. Oil 'ave you rotoscoped on a new septum for Daniella yet? And what about Dot Cotton's specular highlights? She's shining like a bleedin' LIZARD!"

Sometimes, your CG should not be televised... <cough> BBC Digital Radio ad <cough> Sorry, a lump of something really nasty just stuck in my throat there. Must've been that Pepperami.

PLUGGED IN

BBC DEBUTS PIERO

BBC Broadcast has unveiled its innovative sports presentation system, *Piero*. The technology enables viewers to watch proceedings from unconventional camera angles - a 3D 'virtual stadium' model is synchronised to images from real play, allowing the action to be analysed from different angles in animated simulations.

[w] www.bbcbroadcast.com



Imagina 2005

SHOW REPORT Artists catch rays and raytracing at Monaco's CG festival

Every year, *Imagina* is a unique opportunity to escape the cold and grey winter of northern Europe for four days

of top-notch 3D conferences in sunny Monaco. February's event celebrated DreamWorks' ten-year anniversary, with special presentations on the making of *Shrek Tale*, and on the Global Illumination techniques used in *Shrek 2*.

Sony Imageworks was also at *Imagina*, with several *Spider-Man 2* and *The Polar Express* VFX presentations. Elsewhere, in a presentation about *King Arthur*, VFX Supervisor Matt Johnson from Cinesite quoted one film reviewer: "Finally, a summer blockbuster without special effects!" In fact, the film was shot in the middle of summer in Ireland, yet ended up looking like it had been filmed in the Alps in midwinter. *Imagina* also covered scientific research into technologies which are sure to be coming soon to a 3D app near you, including the use of stills and animated footage to derive textures, geometry, optical flows and animation, and ways of subsequently combining these artefacts with dynamic simulations.

Awards highlights included the funny and poetic *City Paradise* by Gaëlle Denis (Best Art Direction Award), the *Onimusha 3* cinematics (Best Animation Award), and Supinfocom's film *Workin' Progress*, which, despite being nominated in several categories, strangely enough came away empty handed...

[w] www.imagina.mc



● ROBOT's excellent *Onimusha 3* game cinematic was recognised for its fantastic animation



● Funny, strange and poetic, *City Paradise* by Gaëlle Denis was one of the most original-looking films shown at this year's *Imagina* festival

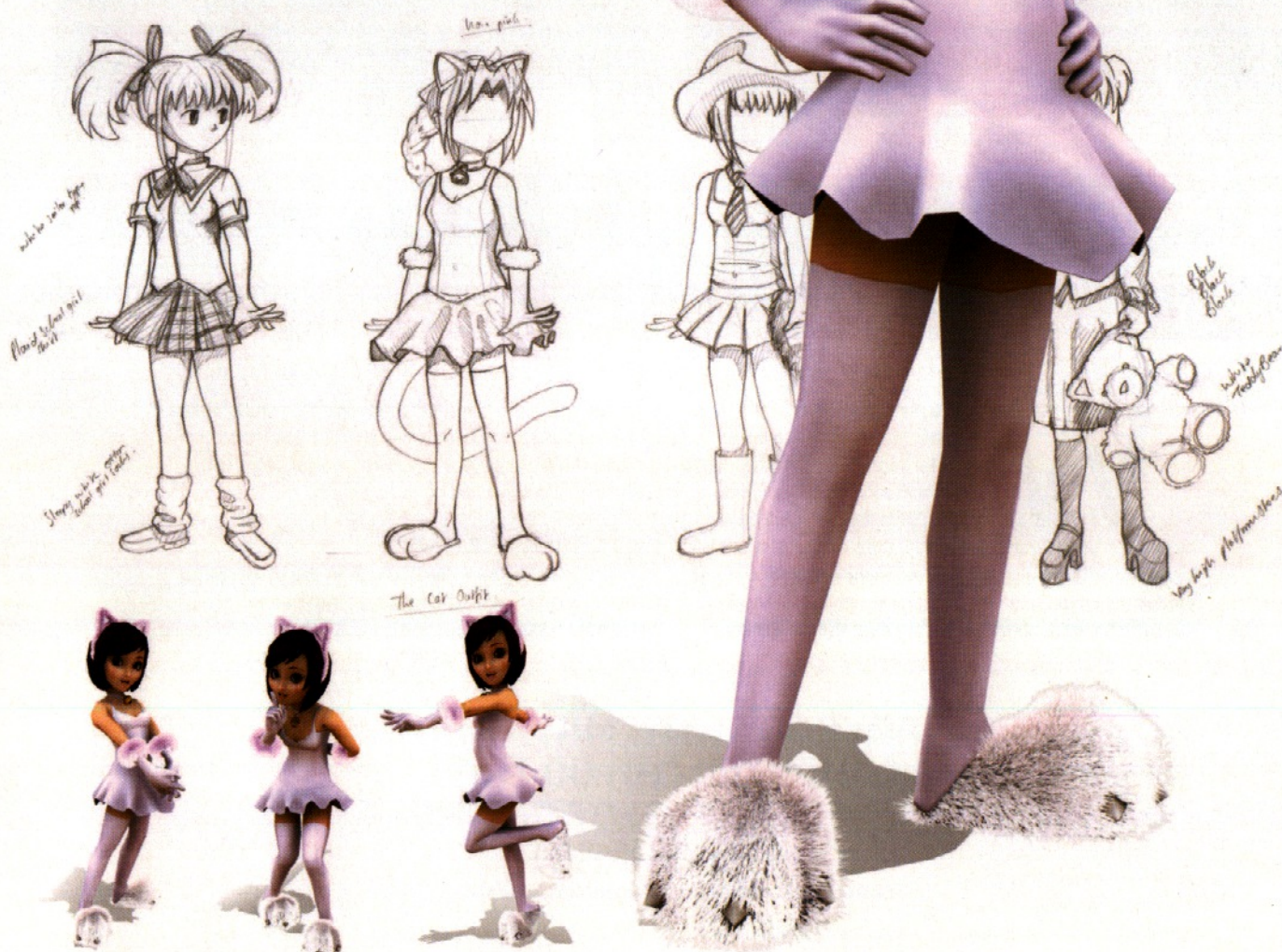
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VALIANT

THE MAKING OF A CG HERO

This month, the UK's first major CG animated movie takes flight, made using off-the-shelf software. We take a gander at Vanguard Animation's feather-filled World War II comedy epic **BY MARK RAMSHAW**

When the makers of *Valiant*, the UK's first major CG animated feature film, refer to the story of "the little bird that could," they're not talking about the plot. Conceived by start-up studio Vanguard Productions as the first of several movies to rely on a new independent financing and production model, the film is aiming for Pixar-level success - despite far more restrictive scheduling and budgeting.

"We worked with a \$40 million budget, building the entire facility - from the software and hardware to the pencils, pens and staff," says co-Producer Curtis Augspurger. "We went from ground zero to completion in 106 weeks."

Cost-saving exercises were necessary to bring the film in on time and budget. The production relied

primarily on off-the-shelf solutions for modelling, animation and rendering. "Our paradigm is drastically different to that of Pixar," says Augspurger. "We didn't have the time, we didn't have the budget, and we didn't have the R&D. But Alias put us into play in a way that wouldn't have been possible five years ago. Any *3D World* reader could do what we did on this movie."

Augspurger and fellow Co-Producer Buckley Collum are from Los Angeles-based MenaceFX, the studio charged with

overseeing the establishment of a new animation studio for the creation of *Valiant*. They were brought on board by Producer John Williams, CEO of Vanguard and Producer of *Shrek*, along with several live-action features.

HATCHING THE PLAN

"[Williams] came to Buckley and me with an idea to do a digital feature at \$40 million," says Augspurger. "We scratched our heads, put a budget together, and it snowballed - investors came on board and [the project] began to grow. Then we found UK funding through foreign presales with Odyssey Entertainment."

Setting up shop in Ealing Studios, Vanguard was uniquely (for CG movie production) able to tap into British and European talent, ultimately working with an eclectic artist base that was drawn from 17 countries.

"We had around nine months of pre-production time in Los Angeles, overlapping with the studio set-up and the start of full production in London, which ran from September 2003," says Collum. "There were a number of concerns with the Soho market. It tends to fluctuate so much, either with a huge amount of business or very little, so when we started to plan our hiring process, we did it on the back of a wave, which enabled us to pull in the right people."

"ANYBODY WITH MAYA AND A COMPUTER CAN DO THIS... IF THEY HAVE A LOT OF TIME ON THEIR HANDS"

CURTIS AUGSPURGER, CO-PRODUCER, VALIANT



● The UK's first major CG animated movie follows the adventures of Valiant, a small pigeon with big ideas about helping the war effort. The entire movie, including the studio built at Ealing to create it, was budgeted at just \$40 million

FACTFILE

PROJECT

Valiant

STUDIO

Vanguard Animation

WEBSITE

www.vanguardanimation.com/valiant.html

PROJECT DURATION

14 months

PROJECT TEAM SIZE

170 at peak

BUDGET

\$40 million

SOFTWARE USED

Maya, Houdini, Shake, RenderMan, mental ray



● Valiant is determined to do his bit for the war effort...



● A costume department was created to deck out each bird in wartime clothing and accessories

► The team scaled up to 170 staff, with about 300 people working on the movie in total. Both staff and infrastructure were brought in for just the one project. "This is actually a single-purpose vehicle," says Collum. "The idea was that, if we were to run a studio and a film at the same time, we would eventually have to make decisions that prioritised the studio at the film's expense, or vice versa. So we decided to focus on making the film, with the idea that we can go and do another in a similar fashion afterwards."

ENGLISH PIGEON

Deciding to locate production in the UK not only opened up a fresh talent pool, but also made it possible to build a studio hierarchy that broke away from the familiar American CG movie-production model: "It was a very fluid environment," says Collum. "Usually these movies are

created at studios with a real sense of structural rigidity, but we benefited by being a little more flexible, with people moving between departments as necessary. One of the great things about Europe is that a lot of the people there are fantastic generalists. So whenever we found someone who excelled at more than one role we'd make full use of it. That ultimately helped us get the production through on time."

Another area that deviated from the feature-film norm was the decision to build character models in 3D, rather than by scanning maquettes. Sculptures were made based on Director Gary Chapman's concept art, but it ultimately proved quicker and simpler to use them solely as visual reference, with a team in LA instead building poly and Sub-D models directly in *Maya* using CPS tools.

Collum says the reasons for selecting *Maya* are both historic and market-driven: "Many years ago I worked at

Wavefront, then Alias|Wavefront and, when Curtis and I started working together in 1998, we chose to use *Maya*," he says. "In addition to feeling most comfortable with [the application], it has a large user base. From the very beginning, when we first decided to rely largely on off-the-shelf software, we knew *Maya* and *Shake* would be the major components."

Augsburger isn't joking when he says the movie could never have been made without the possibilities offered by *Maya*. He reveals that one of the key artists first approached the studio with a strong portfolio featuring sculpture and 2D animation, but with no 3D experience at all. They suggested that he download the *Maya Personal Learning* edition and spend a few months getting to know the program. By the time the UK operation was up and running, the artist was ready to join the team: "The fact that he did such a fantastic job on the movie is a tribute to the program. And of course Alias gets to capitalise from it, because it means companies like us become keen to tap into that large artist base."

3D-DAY

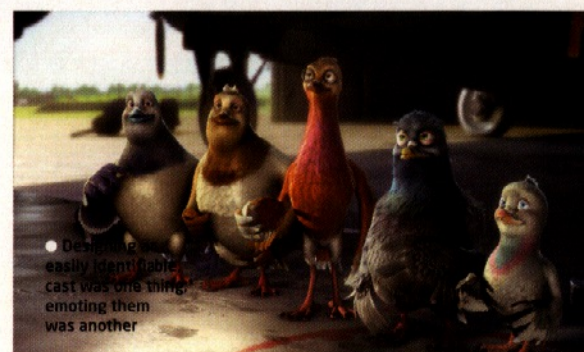
The plot follows the exploits of a wood pigeon called Valiant who, determined to do his bit in the World War II war effort, worms his way into a training camp for Royal Air Force messenger homing birds. Somehow surviving the ordeal, he's assigned to take vital war plans over to occupied France in preparation for D-Day, a mission that pits him against the evil Von Talon and his brigade of ruthless falcons. It broadly does for the British war movie

"OUR ARTISTS CREATED LOTS OF DIFFERENT, GOOFY-LOOKING BIRDS. THEN THERE'D BE A SORT OF CASTING SESSION..."

BUCKLEY COLLUM, CO-PRODUCER, VALIANT



● The wings took over a year to develop: "One of the difficulties we had was that they had to perform both as a wing and like a human arm and hand," says Co-producer Curtis Augsburger



● Designing easily identifiable cast was one thing, emoting them was another

● Once animators had finished their work with a lo-res proxy, a higher-res bird skin was then passed from Maya into Houdini, where feather generation took place

what Aardman's *Chicken Run* did for *The Great Escape*, its richly comic story played out against cleanly rendered visions of the bucolic English countryside, period London, a military training base, then across the Channel and into more sombre, war-torn territory.

Designing a cast of unique, easily identifiable birds was one thing; coming up with a rig that would allow them to emote well enough was another. Even something as invisible as the system governing the movement of the wings took over a year to develop.

"One of the difficulties was that they had to perform both as a wing and like a human arm and hand," says Augspurger. "We'd previously worked with Polygon Pictures in Japan, so went back to them for help developing the rig. And in fact, we used the same rig for all the characters, except for our mice. That really optimised things. We had artists working on a 'scene' basis, rather than by character - with animation leads ensuring continuity of performance - so once an animator had learned how to work with one character, they could handle any of the others."

The facial system developed for *Valiant* also sprang from Augspurger and Collum's relationship with Polygon Pictures: "A guy called Hidetaka Yosumi wrote a *Maya* plug-in called *Chanko*," says Augspurger. "It gives the animator a version of the character head inside a picture frame, with a very efficient set of controls. And because the skeletal system is identical for each character, *Chanko* makes it possible to pass animation between them, and also to store expressions that can be dropped back into any scene, ensuring good results very rapidly."

For guidance and inspiration on creating the right personality for each character, the animators looked to the director, rather than working from footage of Ewan McGregor, John Cleese, Hugh Laurie, Tim Curry, Jim

"WE BUILT ALL CHARACTERS IN MAYA. IT WAS LESS EXPENSIVE THAN GOING THROUGH THE WHOLE MAQUETTE PROCESS"

BUCKLEY COLLUM, CO-PRODUCER, VALIANT

Broadbent and Ricky Gervais, who voice the movie's leads. "The actors were useful for getting the timing right and influencing some facial expressions, but frankly we didn't have time to get contracts signed to enable us to film each actor," admits Augspurger. "I can see Gary Chapman in every one of the characters, though. He'd be on the animation floor doing weird head movements and pigeon walks, giving the animators the ideal personification of every character. The animators would also video their own performances to help them work out how best to animate scenes."

GENERIC PIGEON GENERATOR

Although the script had been considered locked down when production began, the last change actually came through just six weeks prior to completion. Augspurger says that the story unexpectedly evolved as they 'discovered' more about their characters, particularly after the various actors had provided their readings. "Any final concerns about the characters being formed well enough for the audience to engage with them dissipated once the animators got their hands on them."

Beyond the heroic lead, Valiant, and the other key characters, a 'generic pigeon generator' was built to flesh out the background birds. "Our artists would create all these variations, with different head and body shapes, producing some really goofy-looking birds, and then there'd be a sort of casting session, with the director



IN FOCUS | Vanguard's Rodney McFall on how Valiant's cast got their feathered looks and period wardrobes



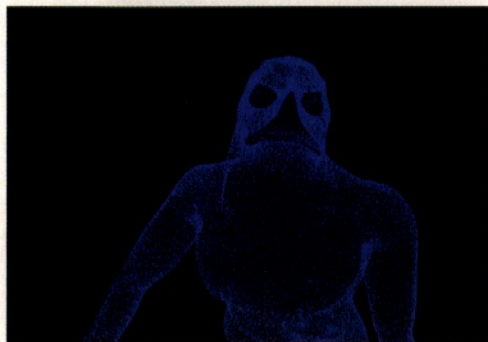
01 "The Character-look Dev pipeline started where the animation (completed in *Maya*) ended. The animation was then sent to *Houdini* for character dressing, shading and feathering (or furring for the mice). From there it was dumped to a RIB archive to be rendered in *RenderMan*, allowing both packages to render the same asset identically when needed."



02 "The *Houdini* part of the pipeline worked on deformation, blending from current frame to next frame in a strictly linear fashion. Once the animation was applied, the normals were combed for feather direction, with feather sizes also painted in. Some calculation was done on each normal to stop it from crashing into surrounding skin surface, which would usually happen when bending joints."



03 "Throughout the movie, the characters wore different costumes that needed to be considered in the feathering process. The feathers had to be pushed down and shortened underneath the costume, otherwise it would crash through, which would be unacceptable. In the *Houdini* file, the wardrobe was read in, with a point colour assigned to it."



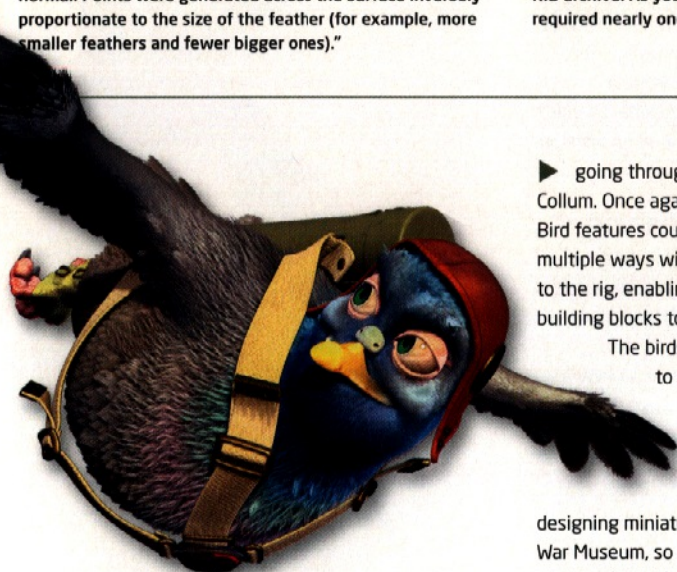
04 "Using a metaball kernel on each point, this colour was transferred to the body, and the data was used to affect the comb and the feather size. The skin surface was also 'pushed' by the reciprocal of the wardrobe normal. Points were generated across the surface inversely proportionate to the size of the feather (for example, more smaller feathers and fewer bigger ones)."



05 "Some of the calculations that would normally be done in the shader at render time were then performed and baked into point variables. These then had curves copied to them before being written out to a RIB archive. As you can see in this image, the face alone required nearly one third of the entire feather population."



06 "On occasion one character would interact physically with another. To avoid crash-through, the same process would be applied to the body with the other character merged into the process as well. These various processes allowed the animators to concentrate on performance rather than worry about how a harness or medal ribbon would affect the final rendered frame."



► going through saying which would land a role," says Collum. Once again, the single rig system proved helpful. Bird features could be stretched, pulled and scaled in multiple ways within the generator, yet still tie perfectly to the rig, enabling walk cycles and other animation building blocks to be applied instantly.

The birds were originally designed to be as easy to handle as possible, but it soon became clear that a costume department would be needed to deck out each bird in deformable wartime clothing and accessories. Chapman got his start designing miniatures for exhibits at the British Imperial War Museum, so he was intimately familiar with the army garb required. Then there's Von Talon, who sports a flowing cape through much of the movie. *Maya's* Cloth Dynamics was well suited to the job. Nevertheless, one artist spent months working solely on the animation for

that one item. And then: the feathers... "We'd originally planned to rely on texture maps but then decided that, in addition to all the extra costume work, we should add feathers, too," says Augspurger. "We really shot ourselves in both feet."

"*Monsters, Inc.* had Sulley, this gorgeous furry character, but then Pixar balanced the workload with Mike, a shiny-skinned monster," notes Collum. "In *Valiant*, every main character is feathered and 'effects-based'. And if that wasn't enough, we threw in a bunch of furred, beret-wearing mice, too!"

The artists assigned to handle the feathering weren't familiar enough with *Maya* to code a feather system, so *Houdini* was chosen at this point. After the animations were worked up on lo-res models in *Maya*, the higher-resolution skin was handed over to *Houdini*, where feather dynamics and some manual tweaking could be performed.



● "The feathers could dynamically interact with forces like wind, but we found that some animators could convincingly do it manually," says Augspurger



In addition to the challenges of adding feathers to an anthropomorphic rig, there was a need for the feathers to interact with those of other birds and with other items:

"Getting a good feathered look and working out how the wings should behave when the bird is doing something like push-ups was one problem," says Collum. "But the real challenge lay with moving the feathers in conjunction with our deformable wardrobe." And of course, any time the animation was tweaked, the feathers had to be readjusted accordingly. Another (unplanned) department was put together solely to check through the feathering and other aspects of animation in every scene, carefully working through to make sure data for feather types, movement, costume elements, and all the interaction between each component looked correct.

"The feathering slowed us down through the majority of our production," says Augspurger. "But once we'd got it fully working, it enabled us to hit our marks in a way I don't think a lot of companies working on this type of production have been able to achieve."

PIGEONS HIT

RenderMan was the tool of choice for most of the output, although Collum says Vanguard ran the whole gamut of rendering solutions, including *mental ray* and hardware rendering within *Maya* itself. As much of the lighting as possible was pre-computed for scenery, in order to minimise render times. "Our CG Supervisor, who previously worked at Weta Digital on *The Lord of the Rings*, came up with R&D that enabled us to deal with the lighting process in a very short space of time. We used a lot of tools that Alias originally created for the games industry, baking the lighting into about 50 per cent of the environments in total."

Taking this route enabled the lighting team - composed of just 12 lighters and a further 12 technical directors - to set up and get approval on around 70 shots per week. "It was a pretty heavy load to haul, particularly when you've got a dozen lighters all working on the same shots and you need to ensure total consistency," says Augspurger. "We lit the whole film in about four months, without ever compromising on quality." With the rendering style, simplicity was key to hitting financial and timescale deadlines. It also proved an ideal partner for the period look called for by the script - a parody of war movies.

"IT WAS JUST A MATTER OF FINDING WHO WAS GOOD AT WHAT, THEN MOVING REALLY QUICKLY TO PRODUCE A QUALITY FILM..."

BUCKLEY COLLUM, CO-PRODUCER, VALIANT

"With some other CG animated movies, the idea is to overwhelm the audience with the visual possibilities the medium throws up," says Collum. "With this film, the story is the most important thing, and we haven't tried to overly heighten anything that might detract from that."

The minimal use of fancy plug-ins or custom code (feathers notwithstanding) also means that the film's visuals will live or die by the quality of the art and animation. "At the end of the day, it all comes down to the artists," agrees Augspurger. "And given that we're competing against studios with 700 seats, I'd say we've done... well, valiantly." ●

Valiant premieres in UK cinemas on 25 March. A US release follows on 15 April. An official website has yet to be announced.

[w] www.vanguardanimation.com



● Having somehow survived training, Valiant heads off into enemy territory. Many environments in the film had their lighting baked in to minimise the lighting and rendering workload



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EURO STARS

The European 3D film evolves

Will the European 3D industry ever be able to rival that of Hollywood? The future stars of the European scene reveal the unique ingredients that lend their films a distinctly un-American flavour

BY MIREILLE FRENETTE AND BENOIT GUERVILLE

Hollywood beware: an new breed of European film makers is coming. "An animated film doesn't need to be made in LA, or any other film capital of the world," says Lenard Krawinkel, Director and Producer at Germany's Ambient Entertainment. "CG technology means that 3D animated movies can be made wherever creative people can be found."

With the democratisation of software and hardware tools, American studios are now no longer alone in developing ambitious 3D animated features. With such recent international successes such as *Les Triplettes de Belleville* heralding the rise of the European studio,

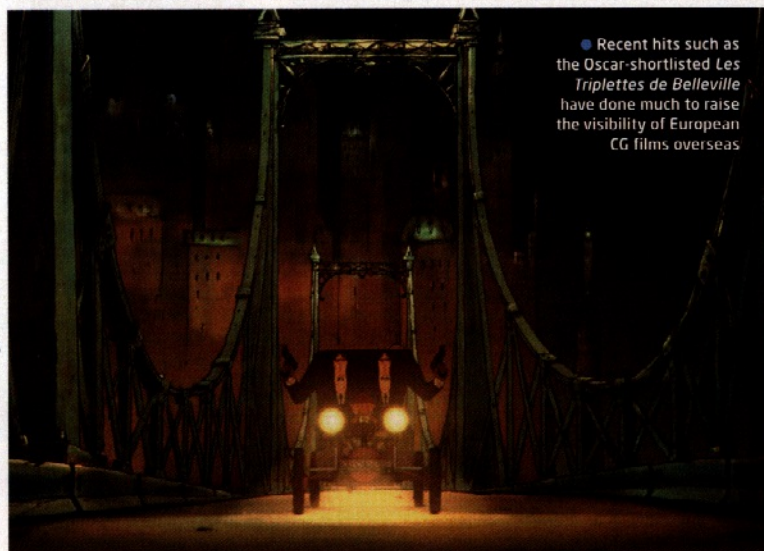
3D World asked prominent producers and filmmakers from across Europe to tell us about their experiences and their visions for the future of European CG films.

YOU SAY POTATO...

The first big difference between European and US studios is, of course, the kind of budget they have to deal with. According to Michael Hegner of Denmark's A. Film, director of the upcoming *The Ugly Duckling and Me*: "Our budgets compare to those of Hollywood by an order of 1:10 for [our largest films], and 1:100 for the smallest ones." But while this enormous difference could be seen as a major issue, European filmmakers tend to take it philosophically: ►



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Recent hits such as the Oscar-shortlisted *Les Triplettes de Belleville* have done much to raise the visibility of European CG films overseas



"Some say a film can't succeed unless it's a Pixar or Disney lookalike. I don't buy that," says *Les Triplettes de Belleville* producer Didier Brunner

"Of course it would be great to have more money," says Lenard Krawinkel. "I'd buy a bigger car, a nicer house, and lots of presents for my wife..."

But in a more serious tone, he asks: "What does an American movie really cost? Nobody knows the real budgets of these films. Americans seem to think that a film will be as good as its price tag is high, so they have to make expensive movies." Aton Soumache, President of Onyx Productions and Method Films (responsible for *The Man Without a Head* and *Renaissance*) agrees: American and European budgets operate in completely different worlds: "It's difficult to compare European and American budgets because the cost of what's on screen isn't calculated the same way," he says. "[American studios] have higher marketing costs, higher salaries, and every scene is animated at least two or three times by different animators before the director picks and chooses what he likes."

Hegner wonders if US studios could even manage to make small-budget CG features: "The difference is in the images. What the Americans do is magnificent, and inspiring. Everything is technically perfect. But maybe this giant machinery makes it hard for them to do a film for a small budget – they just have too many specialists. [US studios] are the best in the world in what they do, but they need so many people to do it. Nobody in the production knows what

all of the others are doing, so they need an elaborate system of communication, and everything is slowed down. In Europe, we have generalists. At the most, our team is made up of 20 people. Everybody is under the same roof – virtually in the same room – so we all talk to one other. You're not left hanging for two weeks because the lighting technician has been away and hasn't got to your scene yet. Production here is less choppy."

But while it's clear that European companies work in a vastly different way from the Hollywood studios, this doesn't mean that they don't keep a close eye on the US market: quite the reverse, in fact. "We learn from [the American studios'] experience and then develop our own production models," says Manolo Gómez, president of Dygra Films, based in Spain. "For example, we were the first to work exclusively on PCs with [full-length CG feature] *The Living Forest*, and it didn't mean a loss in quality for us."



A still from Ambient Entertainment's *Back to Gaya*. As with many European films, viewers commented on the movie's "refreshing lack of the sentimentality associated with the genre"

"A SMALL BUDGET IS NOT A NUISANCE. YOU START THINKING, 'WHAT CAN I DO ON THIS BUDGET?' IT'S A CHALLENGE."

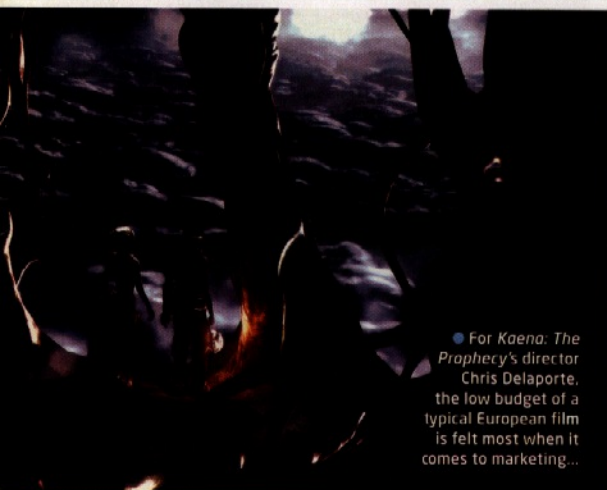
MICHAEL HEGNER, DIRECTOR AND CREATIVE HEAD OF 3D AT A. FILM, DENMARK



Back to Gaya (released in 2004, and pictured above) was Germany's first completely CG film. Director Lenard Krawinkel, characterising the European film industry's ambivalent relationship with the US market, argues: "The European production style is much more of a guerrilla style of filmmaking, but co-operating with US distributors and stars would be my dream."



Having to cope with a smaller budget also means a certain degree of artistic freedom: Denmark's *Terkel in Trouble* is a very politically incorrect movie that was, nevertheless, profitable in its own country



• For *Kaena: The Prophecy*'s director Chris Delaporte, the low budget of a typical European film is felt most when it comes to marketing...



• ...although *Kaena: The Prophecy* was sold in 30 countries, distributors were more interested in the DVD than theatrical releases

► For the same reason, European studios tend to rely on off-the-shelf software (*Maya*, *3ds max* and *XSI*): "We let the Americans spend time and money on R&D," says Hegner, "then buy the software when the technology's publicly released." But all studios work with programmers who develop plug-ins and bridges between applications. And Chris Delaporte, Director of *Kaena: The Prophecy*, wonders if sometimes development is only done for the sake of technology, while the full possibilities of off-the-shelf software aren't even thoroughly exploited: "Isn't technology mainly a concern for technicians?" he asks. "The movie-going public doesn't seem to see the difference"

Another way to deal with small budgets is to subcontract the work to countries where labour is less expensive, such as the former Communist countries or Asia.

Piccola, Saxo et compagnie, due in 2005, is pre-produced in France but made in Romania. Roch Lener, President of Millimages, the production company responsible, explains: "The advantage of our system of outsourcing is that the studios work exclusively for us... so it's not like subcontracting to companies where quality control remains a major problem."

EUROPEAN CONTENT AND STYLE

But aside from budget, the main difference between American and European films is the artistic content. Even if *The Magic Roundabout* [see page 20] is family-oriented, several other productions are more adult, arty, or simply different. Dygra's films tackle more mature and provocative issues, such as the environment in *The Living Forest*, the excessive materialist consumerism in the upcoming

Midsummer Dream, and the co-existence of different cultures and globalisation in *Holy Night* and *Asinus Aureus*. The French film *Renaissance*, currently in production, is a stylish black-and-white thriller that's hardly aimed at children. And even when they go mainstream, European CG films keep a European feel. That's the case for *The Ugly Duckling and Me*, based on the Hans Christian Andersen classic, in which the baby swan is given a rat as a sidekick.

Soumache, whose film *Renaissance* has been picked up for distribution by Disney, believes that the way to succeed in Europe is to do what Hollywood can't afford to do: "Disney would not have wanted another *Incredibles*. Our project took the artistic chances that Disney would not dare risk in production."

WHERE NEXT?

So where do we go from here? According to Soumache, there is little chance of budgets for European CG films rising significantly in the near future, since most 3D animation studios are not yet stable enough to gain the trust of local investors: "For a studio to produce, it needs a team that works effectively together. To do this, it would do well to have at least two films on its slate. Otherwise, it builds a team for one film, breaks it up at the end of production, then tries to re-hire it once a second film is ready to go."

Aside from the nervous investors, low budgets have much to do with markets and distribution. The European market is not unified like the US market. Furthermore, access to US distribution is always a challenge. "Nobody in Europe would consider producing a film just for their own country," says Gomez. Hegner agrees: "The fact that a film is European can, in itself, be seen as a weakness in terms of marketability," he says. "Perhaps it's because past animated features have not been up to standards storywise..."

And, as ever when talking about filmmaking, it's the story that counts. Everyone we spoke to insisted that, with CG, the plot is everything – and much more important than the movie's technical aspects. You only have to look at the success of relatively crudely animated movies, such as some Japanese anime or films such as *South Park: Bigger Longer and Uncut*. The impact of box-office successes like *Ghost in the Shell*, or even *Shrek*, also proves that there is an adult

"WHAT JUSTIFIES THE FACT THAT FIRST TOY STORY COST \$30 MILLION, BUT THE BUDGET FOR THE SEQUEL WAS \$90 MILLION?"

LENARD KRAWINKEL, DIRECTOR AND PRODUCER AT AMBIENT ENTERTAINMENT, GERMANY



• "Isn't technology mainly a concern for technicians?" asks Chris Delaporte, Director of *Kaena: The Prophecy*. "The movie-going public doesn't seem to see the difference"

ONES TO WATCH | 3D World's pick of the best upcoming European CG movies



© A-Film A/S

The Ugly Duckling and Me

A-Film A/S, Denmark

[w] www.afilm.dk

Due 2005

Based on *The Ugly Duckling* by Hans Christian Andersen, the film tells the story of a duckling and his friend, Ratso the rat, who's forced to look after the duckling when he's abandoned by his 'family'. Director Michael Hegner is creating a unique design for the film, combining 3D animation with a funky humorous style, while retaining the atmospheric visuals of children's books.



© 2004 Dygra Films / Appia Filmes

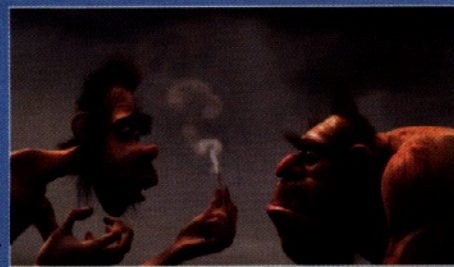
Midsummer Dream

Dygra Films, Spain and Appia Filmes, Portugal

[w] www.dygrafilmes.es

Due 2005

Loosely inspired by the characters of Shakespeare's play, the film reminds us that it's worth dreaming, even though this world of haste, money and possessions makes it harder and harder for one to do so... The budget is €8m and European distributors are lined up for release on the same date in seven countries: Spain, Portugal, France, Belgium, Holland, Luxembourg and Switzerland.



© Les Armateurs / Boréales / Pequod / Pathé

Why I Did (Not) Eat My Father

Les Armateurs, Boréales, Pequod and Pathé, France

[w] www.pathe.fr

Due 2005

Celebrated commercials director Pierre Coffin helms this intensely funny fable on the difficult beginnings of humanity. Mac Guff Ligne is handling the production, with some animation to be done in London. International talent includes 3D Animation Supervisor Kyle Balda (*Monsters Inc.*), Daniel Cacouault (DreamWorks' creative director) for set creation and Carlos Grangel for character design.



© Onyx Films / Millimages / Timefilm LTD / Locomotion / France 2 Cinéma

Renaissance

Attitude Studio, Onyx Productions & Millimages, France

[w] www.millimages.com

Due 2005

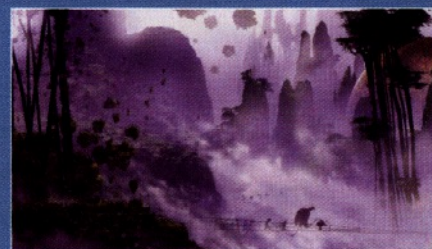
A stylish black-and-white futuristic thriller, directed by Christian Volckman and written by Mathieu Delaporte and Jean-Bernard Pouy. The story takes place in Paris in 2037, when a beautiful young scientist is kidnapped and an officer starts looking for her. The film also features a giant pharmaceuticals company thrown in for good measure. Buena Vista International has picked up US rights.

Piccolo, Saxo et compagnie

Produced by Millimages in France with most of the production done by its Romanian subsidiary. Due out late 2005.

Dragon Hunters & Malo Korrigan

Produced by Futurikon in France, *Dragon Hunters* expands the animated series of the same name into a full-length 3D feature. The company is also working on a second feature film, *Malo Korrigan: The Spaceships of Time*. Both due out in late 2005.



● A still from the upcoming *Dragon Hunters*, which makes the transition from TV to film later this year

Azur et Asmar

Directed by Michel Ocelot (*Kirikou and the Sorceress*), and set hundreds of years ago, this is the story of two boys - one Muslim the other, Christian - who grow up together but are separated. They eventually they reunite years later. The film is animated in 3D, then reworked for a 2D feel. Due out in 2006.

Urmel aus dem Eis

A German co-production between Studio Bavarla and *Back to Gaya* veterans Ambient Entertainment. Due out in 2006.

Arthur

Produced by Europa Corp and directed by Luc Besson (*The Fifth Element*), with Madonna due to record the voice of Princess Selenia. Due out in 2006.

"OUR FILMS TAKE THE ARTISTIC CHANCES THAT COMPANIES LIKE DISNEY WOULD NOT DARE RISK IN PRODUCTION."

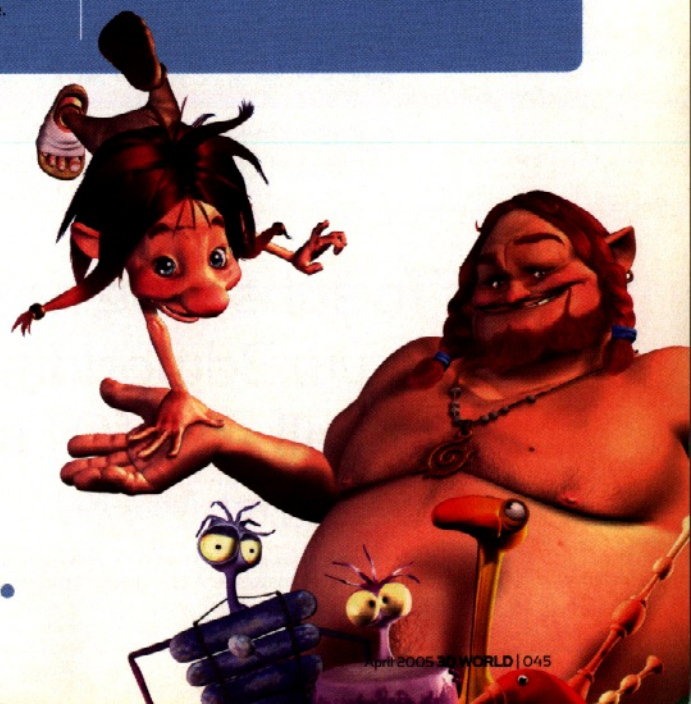
ATON SOUMACHE, PRESIDENT OF ONYX PRODUCTIONS, FRANCE

audience for animated films in the English-speaking world. And this is opening even more new possibilities for the European studios.

Over the years, the Asian animated film industry has imposed its own strong identity that American studios are increasingly emulating [see our feature on the Japanese animation industry in *3D World* issue 59]. Whether the same will happen for European CG films is hard to say - the medium is so new and European films' styles are fairly distinct from one another. However, while several European studios grow and get high-budget worldwide releases, many smaller firms will continue to come up with innovative and

artful projects that belong more to the world of craftsmanship than to industry mass media production.

"We're on the eve of post-technology films," says Soumache. "Technique is no longer in our way. In films like *Sky Captain and the World of Tomorrow*, the last *Star Wars* film or *Immortel*, 85 per cent of the images were CGI. Soon, to make a distinction between a CG animated film and a film with VFX will no longer make sense." ●



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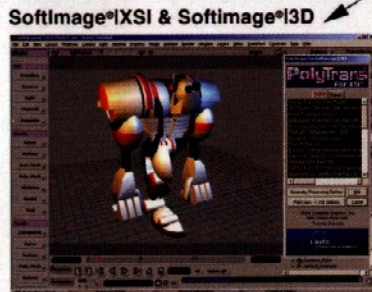
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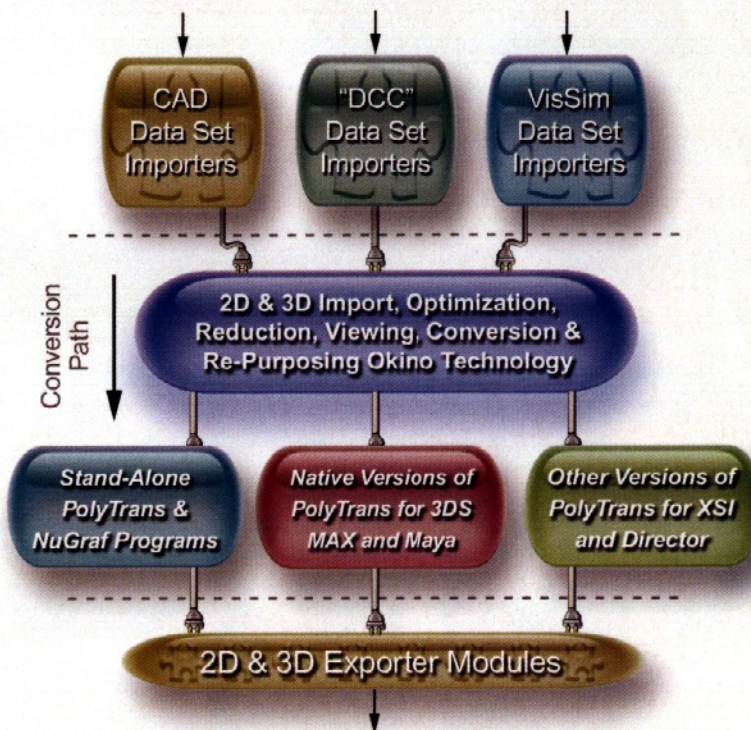
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TUTORIALS

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MAYA

aardman speaks!

Learn to lip sync your 3D characters the Wallace and Gromit way with this masterclass in facial animation, based on the techniques used on CG projects at the legendary studio Aardman Animations **BY STEFAN MARJORAM**

FACTFILE

FOR

Maya

DIFFICULTY

Advanced

TIME TAKEN

2 hours

ON THE CD

- Full-sized screenshots
- Base audio file
- Four supporting Maya scene files
- Tutorial movie (QuickTime)

More often than not, CG lip sync suffers from being 'floaty' and lifeless. I feel that clay animation is usually much snappier and livelier, due largely to the use of straight replacements. With replacement animation, one mouth shape is completely removed from the face and replaced with another different one, which is then sculpted over a few frames before being replaced with another mouth shape. It's this liveliness that I've tried to recreate using Maya's blend shapes.

In the next few pages I'll show you my lip synching workflow. It's by no means a way of doing hyper-realistic mouth animation but, at the same time, I do make an effort to make it accurate. The tips and methods you'll read about are ones that I've picked up and adapted in my time at Aardman.

One of the first jobs I had was animating a CG version of a scene from *Chicken Run* because Aardman was investigating the possibility of a straight-to-video sequel. It didn't happen, but by painstakingly copying the chickens' every move and beak shape, I really learnt a lot about the Aardman technique. The sort of lip sync I do is more suited to stylised or cartoon characters and, as such, is quite caricatural – some good

examples are the UK's BBC3 'Blobs'idents or the *Creature Comforts* series. But even if it's not your cup of tea, I still think most people will learn a lot about lip synching and character animation in general by following this tutorial. This isn't a beginners' guide, so I will be assuming that you have some previous animation experience: rather than explain the process in minute detail, I'll be covering the key points, then leaving you to work out how to put them into practice for yourself.

On this issue's CD, you'll find four scenes and a movie of the finished animation. The first scene is the character without any animation, all ready to go. The second is how it looks once I've done the bulk of the animation using the Blend Shape sliders. The third pass shows how it looks once the Curves have been adjusted in the Graph editor, and the final scene includes head movements. Feel free to use my character to work through the tutorial the first time. Once you complete it, have a go with one of your own characters – you'll learn just as much again!

Stefan Marjoram is Creative Director at Aardman. He designed and directed the BBC3 'Blobs' and the short film *The Deadline* [w] www.aardman.com

**ON THE CD**

Note: the character
supplied is not
royalty-free
SEE STEP 1

EXPERT TIP**Roughed up**

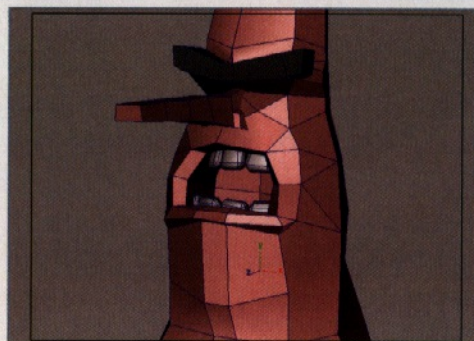
Traditional animators have a lot to teach CG artists when it comes to lip synching. As an experiment, when you've finished this tutorial, select the mouth shape curves in the Graph editor and change them to Step tangents. There now won't be any smooth transitions from one mouth shape to another. It's something that's often seen with puppets but rarely in CG - it might look a bit rough, but sometimes CG (with all its accuracy) needs roughing up a bit.



STAGE ONE | Building your character - "Oohs", "Ees" and "Aahs"



01 Here's a character I built a little while back with a view to doing some comical sketches. He's very simply constructed, so should be easy to animate and update on most machines. Feel free to use him to work through the tutorial, but make sure the results aren't broadcast or published, either in print or on the web. The model isn't royalty-free, and I own the copyright!



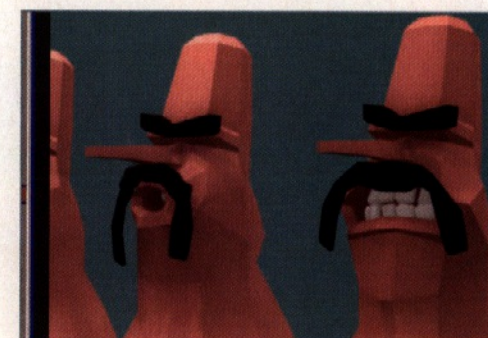
02 There's nothing worse than animating something that takes an age to update when scrubbing through the timeline. When building your face, use the isoparms or polygons efficiently. Obviously, you'll need enough to capture your design details, but it'll be a lot easier to sculpt the various shapes later if there aren't too many. I usually build mine in a neutral pose, the mouth slightly open.



03 The amount of blend shapes required can vary, but you'll need at least these five: "Aah", "Ee", "Oo", "B/M/P" and "F/V." Using the sliders to mix several of the shapes together will give quite a wide range of other shapes. Sometimes I add a jawbone to the blend shapes to give more expression but, for this tutorial, we'll keep it simple and leave it off.



04 Try mouthing the sounds "Aah", "Ee", "Oo", "B/M/P" and "F/V", mentioned above in step 3, in front of a mirror. Really watch what happens to your lips - it'll give you a good idea as to what to sculpt. Try to avoid any nasty creases and make sure you capture the tension in each position.



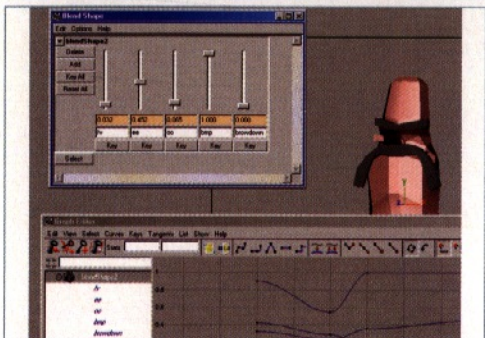
05 In the mirror, you'll notice that the "Oo" shape is nice and round. You can also see how the air wants to burst out of your mouth when you do the "B/M/P" sounds. Feel how the lower lip is stretched over the bottom teeth and tucked under the top ones for the "F/V" sounds.

EXPERT TIP

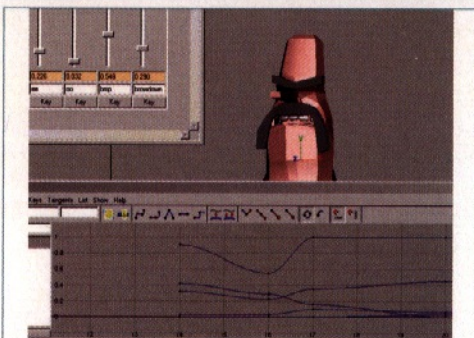
All a Shmutter

Look out for inhales and 'shmutter' in your audio track. Shmutter is a radio term for noises made when people lick their lips, open their mouths, stutter, sniff and so on. These are often edited out of broadcasts, but I like to include them in my animation; it's these little details that help bring a character to life, and they'll give you an excellent idea of what the speaker's doing. Get yourself a good pair of headphones before doing this: that way, the rest of the room won't have to listen to you endlessly scrubbing through your audio!

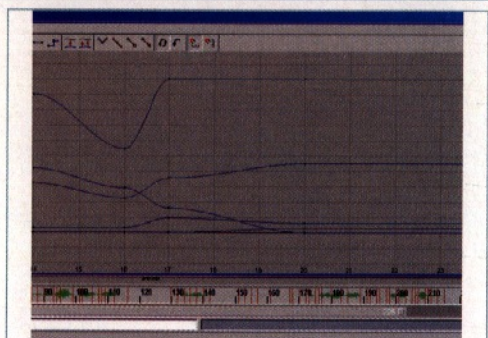
STAGE TWO | Starting to animate



06 Drag the .wav file on the CD into the timeline and open your Blend Shape panel from the Window: Animation Editors menu. You'll be saving all your keys by clicking on Key All. It's also a good idea to click the Select button - this shows your keys in the timeline and also in the Graph editor.



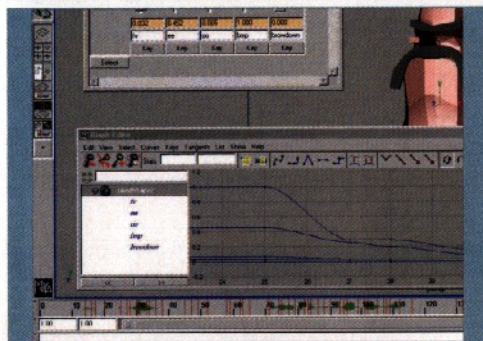
07 The first word is "Erm." Scrub through and you should hear the first bit of voice on frame 15. Put a key on 14 and scrub a little further. You can hear the "M" on frame 17. The mouth will have to be closed again by then, so that only gives you two frames to open it over. Animate this, then close the mouth and key it on frame 17.



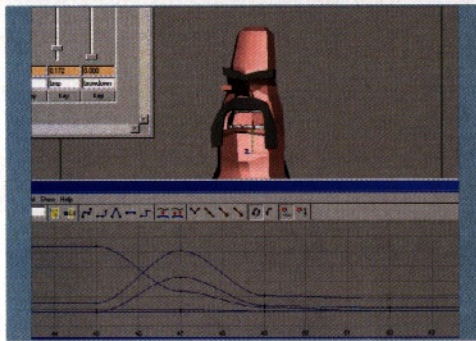
08 It would be a really good idea to try to continue some of the movement into the holds as this makes the character's lip synching more believable. For example, when our character closes his mouth at the end of "Erm," I've continued to compress his face for another three frames. This will all add to the feeling that there are muscles and mass in the equation, making it seem less robotic.



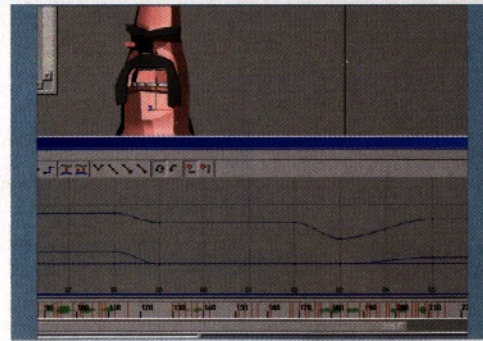
STAGE TWO (Continued) | Starting to animate



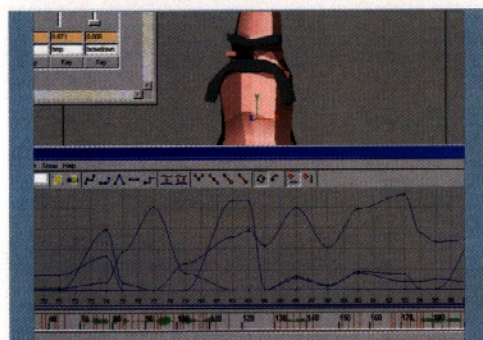
09 On frame 26, you can hear some shmutter. It's the noise of the mouth opening, so make sure your character's mouth is closed when you get to it. Animate it between frames 25 to 28 and then go on to the "Hello." Notice that I've carried on moving the "O" shape, as with the earlier "M." I'll be doing this a lot from now on, so look out for it.



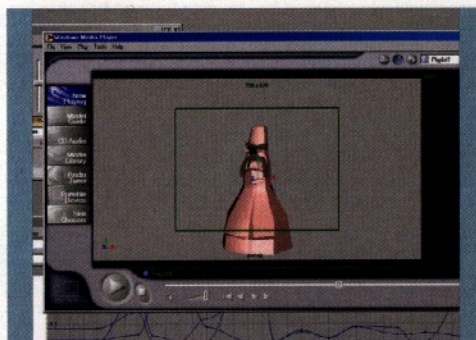
10 Next, there's an inhale. If you listen carefully, it does sound like the mouth closes momentarily at the beginning, though. Find the start of the inhale, go back a few frames and add a key - mine's on 45. It sounds to me like it starts to open again on 47 or 48.



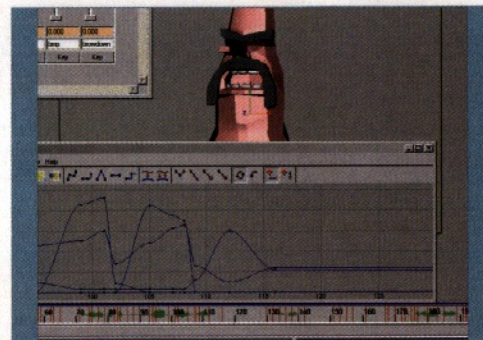
11 Listen to 58 and you'll hear the faintest of noises. There's another at 61. This is a bit like the noise I make when I'm struggling to find the right words. It's tiny, but I think it would be nice to pick up on it in the animation. With the first one being so short, let's try a one-frame move. The next one can take a few frames longer.



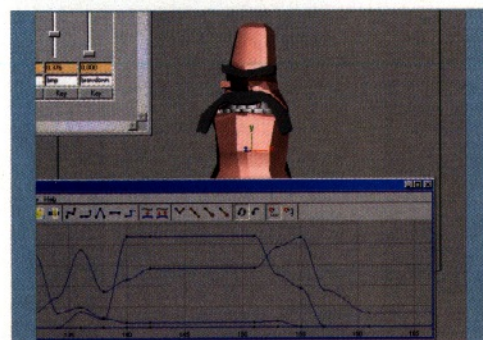
12 The next interesting part is the "P" noise in "Expecting". The rule for closed-mouth shapes is that they must be held closed for at least two frames for them to read clearly. This can be tricky if a character is speaking really quickly. If necessary, close the mouth a frame early to give you the two closed frames, but don't open it a frame late - it'll look out of sync.



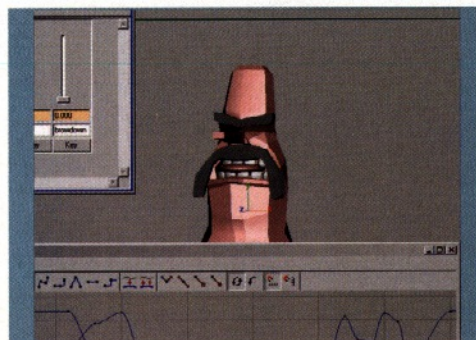
13 Carry on, and notice how the movement carries on the drawn out "F" of "Film" and "N" of "Now." Perhaps you should try a Playblast at this point to see how you're getting on. Hopefully it should be looking nice and snappy. It'll get even better when we refine it later.



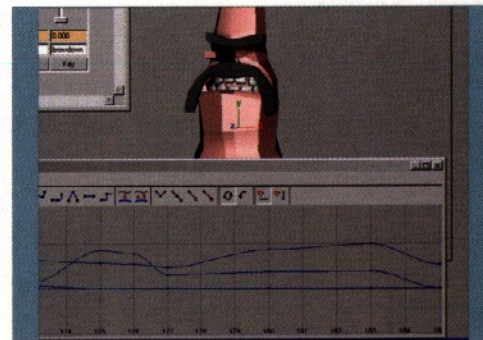
14 When you get to the end of "Now" on frame 112, there's another weird noise after it - a sort of exhale. I think it's worth doing something to go with it. It'll be one of those extra little details that help the animation feel more believable.



15 There's a very nice inhale at frame 151, which has a kind of lip smack noise to start with. If you kept your mouth shut from the previous "Erm," it'll be a good point to show a bit of the teeth before the mouth opens for the proper inhale.

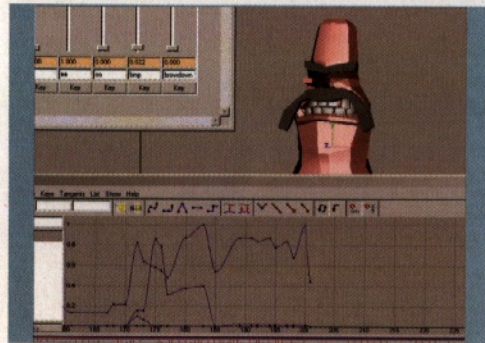


16 For the "Th" in "There's", you could add a tongue between the teeth - particularly if you're going for the true *Wallace and Gromit* look. I find you can usually get away without one by just putting the teeth a bit closer together.

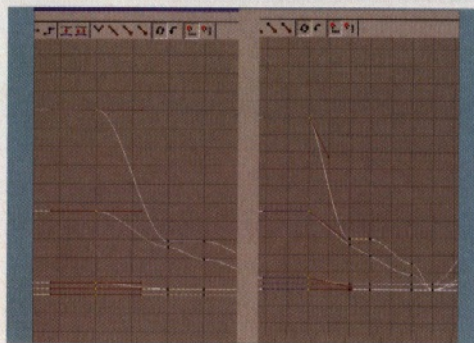


17 A good lip synching skill to master is knowing what not to animate. The beginning of the last line is fairly fast; if you try to animate every little bit, it'll look too busy. I'm going to leave out the "A" in "Been a slight..." and go straight from "N" to the "S" sound. It'll also help with these faster bits if you keep the movements a bit smaller.

STAGE THREE | Refining the animation



18 Sometimes I like to add something to my animation that isn't necessarily apparent in the track - this, again, makes the whole thing seem more believable. This chap's obviously having difficulty getting his words out, and there's a nice gap before the last "A slight problem," so I've added some movement to suggest that he's trying to say "A" but nothing's coming out.

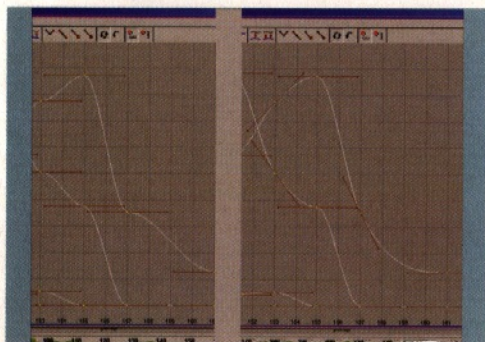


19 Now that the bulk of the animation is done, we can return to the Graph editor to refine it a little. Occasionally the mouth doesn't open fast enough, particularly after a closed mouth shape. Select the keys on the last frame, break the handles and shape the curve into a nice fast in, slow out form.

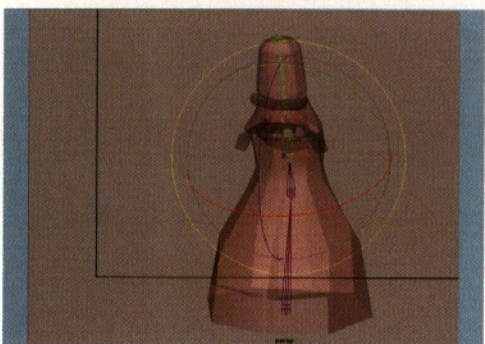
EXPERT TIP

Make it snappy

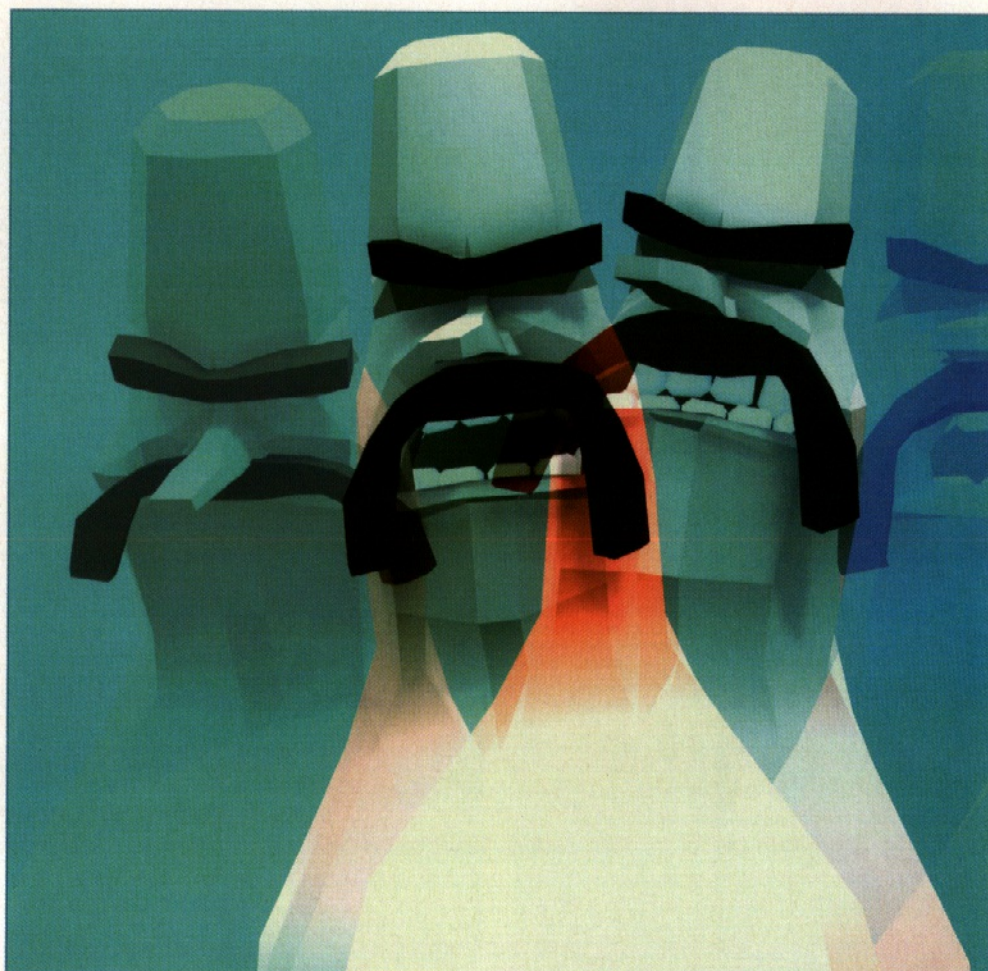
Breaking the handles (see step 19) is a good way to get snappy animation into anything - not just mouths. Try this simple test. Using two keys, move a sphere from one position to another with tangents set to Flat or Spline. Break the first key's handles in the Graph editor and pull them down, making a quarter-circle shape. Play it again, and the sphere now covers the majority of the distance in the first frame without acceleration. It'll come to rest smoothly and feels sprightly. If you apply this technique to your character's bones, he'll feel sprightly too!



20 Sometimes you'll notice a curve that seems to be trying to go smoothly from one key position to another but that has a step in it because of the flat tangents we're using. Grab hold of the handle and rotate it slightly to smooth it out.



21 Because all the action happens around the lower half of the face, the mouth can sometimes feel a bit disjointed and separate from the rest of the head. A good technique is to add a little head movement on some of the wider mouth shapes, so tilt the head back a tiny fraction and return it each time. I'd add some other head movements at the same time.



22 And that's more or less it. Do a Playblast and, with any luck, you should have a pretty respectable piece of lip sync in front of you. If there's anything amiss, go back and do a few tweaks here and there. But remember not to go overboard or the resulting animation will look too fiddled with. I often start the animation process like this, with the lip sync first, although some people say you should

start animating with the rest of the body. Go with what you find more comfortable, but I find that listening to the audio so carefully during the lip synching gives me a really clear picture of what the rest of character should be doing. If your character has eyes, refining the animation further with some eye movements and blinks will help enormously, of course - but that's another tutorial. ●

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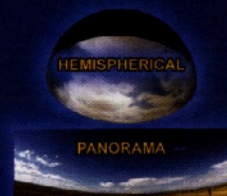


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• DAZ|Mimic 2.1 Standard, free on this issue's CD, creates animation data for Poser or DAZ|Studio, automating the process of lip-synching a character

DAZ|MIMIC

Read my lips

The tricky art of lip-synching is made easier thanks to DAZ|Mimic 2.1, an automated speech animation tool. This tutorial tells you all you need to get mouthy...

BY MIKE DELA FLOR

FACTFILE

FOR

DAZ|Mimic 2.1 Standard

DIFFICULTY

Basic

TIME TAKEN

30-45 minutes

ON THE CD

- DAZ|Mimic 2.1 Standard
- Victoria 3 Base model
- Audio file for tutorial
- Text file for tutorial
- Finished animation
- Full-size screenshots

ALSO REQUIRED

Poser 4 or 5



ip-synching is one of the most challenging aspects of character animation, and something that looks awful when not done properly. Which is where *DAZ|Mimic*, a full copy of which can be found on your CD this month, comes in. Load any WAV file into *Mimic* and its Talkback engine will analyse the audio file's phonemes and attempt to synchronise the audio with the appropriate mouth positions. The result is a character that appears to speak naturally.

Generally, *Mimic* does a good job at lip-synching all by itself, but as with any automated process, there is room for improvement. One of the better aspects of the program is that it allows you to refine the speech animation by adjusting the strength of the phonemes (morph targets) and the position of the phonemes along the Timeline. With a bit of patience, it's possible to create believable speech animation.

Mimic 2.1 Standard can only create the animation data, which must then be exported to a program like *Poser* or *DAZ|Studio*. It works best with DAZ characters such as Victoria or Michael, both of

which can also be found on the CD, although it is also possible to import *Poser* characters or even your own creations

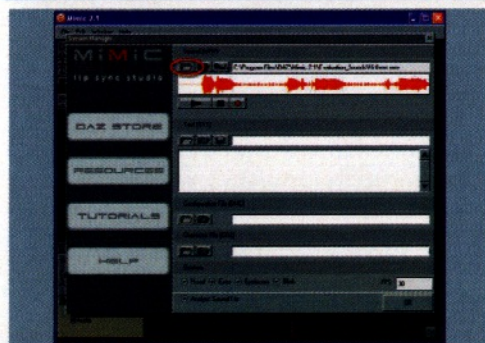
The following tutorial will show you how to get DAZ's Victoria 3 character to croon the words, "Hi there, I am Victoria, what's your name?" Using keyframe animation, it could take many hours to create a lip-synched animation, even to this short phrase, but with *Mimic* it can be accomplished in a matter of minutes. In the first few steps of the tutorial you'll learn how to set up audio files and load Victoria in the Sessions Manager. Next, you'll get a taste of lip-synching by adjusting phonemes, then export the *Mimic* data as a PZ2 file and load it into *Poser* to create the final movie.

All the files for this tutorial can be found on this issue's CD (page 115). Before beginning the tutorial you should install *Mimic 2.1* and the Victoria 3 model. You'll also need a copy of *Poser 4* or *5*.

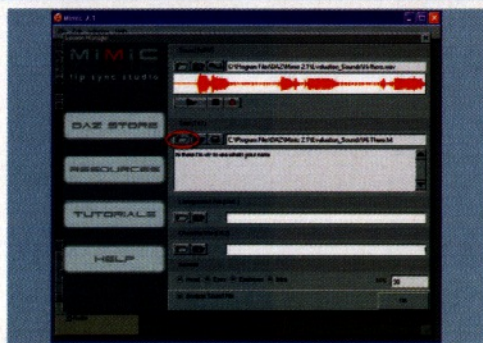
Mike de la Flor is a medical illustrator and author of *The Digital Biomedical Illustration Handbook* and *The Carrara Studio 3 Handbook*. He teaches CG at Kingwood College, Texas [w] www.delafior.com



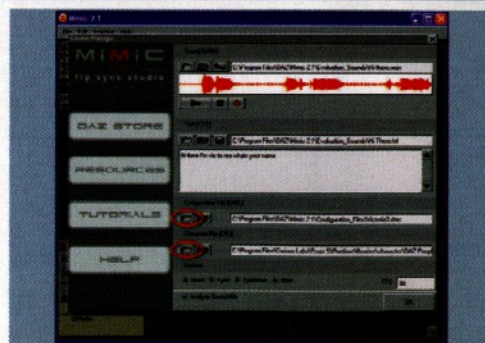
STAGE ONE | Set up your files



01 The Session Manager window enables you to select or record the audio file to be lip-synched and the character that will do the speaking. For this tutorial we'll use a stock audio file that installs with *Mimic*. Click once on the folder icon in the Sound (WAV) section of the Session Manager. Browse to the file named *Hi there.wav*. Test the audio by clicking once on the Play button.

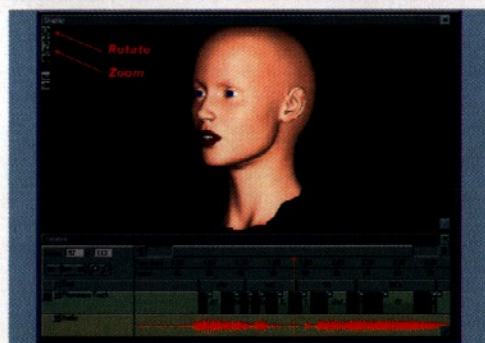


02 To optimise lip-synchronisation, *Mimic's* Talkback engine can analyse a phonetic text file in conjunction with the audio file. In the Text (TXT) section of the Session Manager, click once on the folder icon and browse to the file named *Hi There.txt*. Notice that the phrase is spelled phonetically.

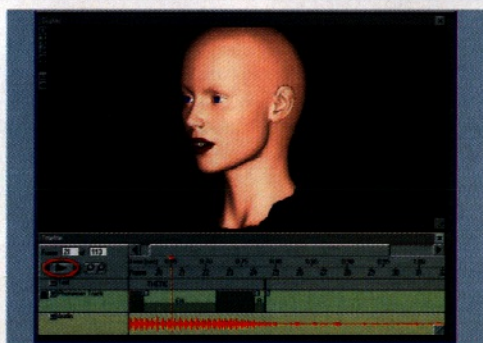


03 We'll now load Victoria. Selecting a character requires two steps. First, click on the folder icon in the Configuration File (DMC) section and choose the *Victoria3.dmc* file. Second, in the Character (CR2) section, load the *Victoria 3 SAE.cr2* file. As a final step in the Sessions Manager, Check the Head, Eyes, Eyebrows, Blink and Analyse Sound Files radio buttons and click OK.

STAGE TWO | Make Victoria speak, then export to Poser



04 With the analysing process complete, the Session Manager closes and the Display and Timeline windows appear. The Display window contains a 3D model of Victoria's head and the Timeline shows tracks for Frames, Text, Phonemes and Audio. Use the Zoom tool to focus in on Victoria's head. If you rotate Victoria to a three-quarter view you can see the mouth movements better.



05 Click on the Play button in the Frames track to watch Victoria speak (the animation loops). What you're seeing is *Mimic's* best attempt at automated lip-synching, but there are a couple of places where the lip-synching can be improved. For instance, when Victoria says: "What's your name" the 'W' phoneme is weak. When "What" is spoken, we purse our lips at the start of the word.



06 Move the Timeline slider until "WHAT'S" appears, to edit the 'W' phoneme. Move the Scrubber over it in the Phoneme track to see Vic's mouth position. Click, then right click, on the 'W' phoneme. From the Contextual menu, choose Edit Strength. Click on the red box in the 'W' phoneme and drag up: move the 'W' phoneme along the Phoneme track to match the audio. Save as 'Mimic Project'.



07 It's time to export the animation data to *Poser*. From the *Mimic* File menu choose Export Pose (PZZ), name the file 'Hi There.pzz' and save it in the Poser > Runtime > Libraries > Pose folder. Next, launch *Poser 4* or 5 and load Victoria from Figures > DAZ People > Victoria 3 SAE. Once Victoria is loaded in *Poser*, click on the FaceCam button to zoom in on her face.



08 To apply the animation data from *Mimic* to Victoria in *Poser*, open the *Poser* folder and locate the *Mimic Hi There* file. Double click on it and select Yes when *Poser* asks if you want to add the frames. Set the *Poser* display to Full Tracking, bring up the Animation Controls and press Play. Victoria speaks!



09 Once you've loaded the animation data from *Mimic* you can continue to pose and animate Victoria with *Poser's* animation tools. You can also add props such as hair and clothing. When you're done, you can render the animation to a movie. ●

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Take advantage of this 3D World offer and you'll save 30% when you order the latest, fully featured version of Mimic Pro, the powerful facial animation utility from DAZ Productions

Mimic is a powerful, fun tool for lip-synching and facial animation – make sure you check out the full version of *Mimic 2 Standard* on the CD, and work through Mike de la Flor's tutorial, starting on page 54. Once you're fully conversant with this version of the software, you'll most likely want to expand your vocabulary of animation moves – and that's why we're teaming up with DAZ Productions to offer you this opportunity to save 30% on the latest versions of the software.

Mimic Pro provides an advanced environment for easily creating and editing facial animation sequences. Take existing WAV audio files and let *Mimic* animate your figure for you. Or alternatively, record your own speech file within *Mimic*'s simple recording studio via a microphone connected to your computer. With the ability to add in

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Mimic Pro is available for use as a plug-in with NewTek's *LightWave* (version 7.5 or higher) or as a plug-in for Curious Labs' *Poser* (version 3 or higher). And, thanks to this reader offer, you'll save 30% off either version of *Mimic Pro* at www.daz3d.com when you order using the coupon code below.

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Pro tips for rigging




Our experts this issue...


ANDREW LINDSAY

 **Andrew Lindsay** is Senior Animator at Lionhead Studios, and previously worked on several animated TV series for kids
[w] www.lionhead.com

WILLIAM VAUGHAN

 **William Vaughan** joined NewTek in 1992 as a *LightWave 3D* evangelist, and is also an instructor at the DAVE School
[w] www.spinquad.com

SHAUN FREEMAN

 **Shaun Freeman** is a freelance 3D artist. He has spent the last two years teaching *Animation: Master* at secondary schools
[w] www.shaufreeman.com

Ready characters for animation quicker and more effectively with this collection of professional tricks for users of Softimage|XSI, LightWave and Animation:Master



igging is the process of preparing a character that has been modelled for animation, by giving it an internal skeleton. This determines where the joints are and how smoothly they move; it shapes a character's co-ordination, from its smile down to its feet. A good rig literally underpins a natural and intuitive character.

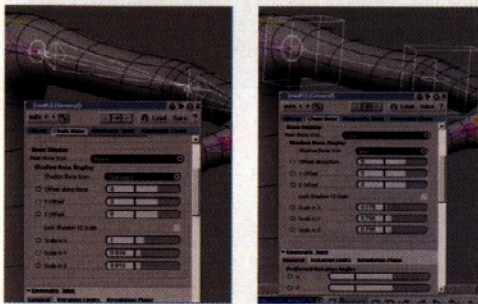
Over the next three pages, leading professionals impart their rigging know-how, providing tips for *Softimage|XSI*, *LightWave* and *Animation:Master* that range from weighting to IK chains, from parameters to bone chains and cloth dynamics. Many of these are universal techniques that can be applied to rigging work across the board of 3D applications.

SOFTIMAGE|XSI

CUSTOMISE YOUR DISPLAY MODES

All the *Softimage|XSI* tips here are based on the rigs that come with *XSI* – the Michael Isner rigs. For an optimum workflow while rigging and skinning, I turn the view to 'Shaded' with XRay mode on and Type set to 'Overlay' in Display Options. Joints in *XSI* have a fantastic visibility option called 'Shadow Bone Display', which enables you to display joints as boxes without the need to constrain NURBS curve boxes or other controls – great for keeping exportable skeletons simple for games.

Select a joint or two (for example, LBicep and LForearm), then press [Enter] to bring up General Properties. Under Bone Display, set Main Display to 'Line' and Shadow Bone display to 'Box' – see the settings in the images below. Here you can apply settings simultaneously on more than one object, allowing you to save a great deal of time by having all your major limb joints selected. [AL]



● ABOVE Turn a Main Bone icon to 'None' or 'Line' and the shadow icon to 'Box', then scale it to be outside your mesh

HASH ANIMATION:MASTER

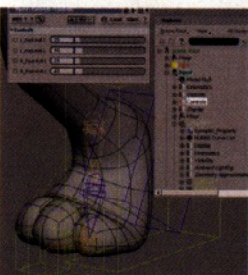
FACIAL RIGGING USING CONTROL POINT WEIGHTING

Using Control Point (CP) weighting to rig the face has a number of benefits, not least that it allows many poses to work together without producing the unexpected results common with additive poses. Different facial poses use these common CP weighted bones, and so additive motion doesn't produce the interesting results that straight muscle motion poses can often generate. [SF]

SOFTIMAGE|XSI

GETTING DOWN TO THE FEET

Softimage|XSI's Isner rigs also have a versatile foot set-up. As it stands, you can choose whether or not to use the foot roll set-up. If you do use the foot roll, the default settings (found under the model/root of the rig as a C-prop set called 'Controls') are rather conservative. Tweak them to 25 and



● LEFT Tweak the default settings in *XSI*'s foot roll set-up for more fluid movement: for details, see the tip above

LIGHTWAVE | Make light work of cleaning up motion-capture

Sometimes, when working with mo-cap data on characters that have different proportions to the mo-cap actor, it's necessary to clean up some areas. You might run into problems such as arms cutting through the body, or big feet intersecting with each other. One way to clean this up is to tweak all the keyframes until you have no problem areas. However, seeing as mo-cap data has a keyframe on

every frame, this could lead to a lot of work. Adding helper bones at all the joints will enable you to fix the areas while keeping the mo-cap performance intact.

For example, if you have a forearm cutting through your character's stomach, place a helper bone as a child to the bicep and the parent to the forearm. Rotate the helper bone away from the stomach; this pulls the forearm away but retains all its movement. [WV]



● ABOVE A quick way to clean up mo-cap data (see tip above): in this shot, the bicep and forearm helper bones are selected...

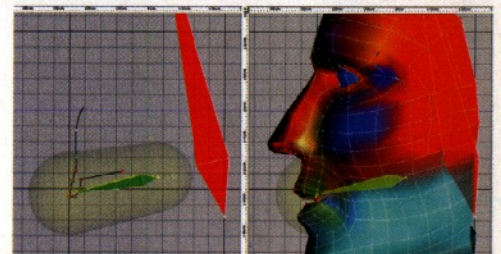
● LEFT ...and here's the bicep helper bone, before and after it was adjusted (left and right images respectively). Full-size versions of these screenshots can be found on your CD

HASH ANIMATION:MASTER

ISOLATING CONTROL POINTS AND ASSIGNING CP WEIGHTING

When using CP weights, some people select each Control Point and manually enter the percentage that each CP is affected by the bone. This is a cumbersome way of doing things, and trying to figure out an appropriate percentage can be a bit hit and miss. A faster and more accurate solution is to place the bone carefully, ensuring that the arc through which it moves is appropriate for the face. (That is, when you move the bone, its line of motion more or less follows the curve of the face.)

Under the bone's Properties, select 'Has Falloff' and ensure the falloff covers all the required Control Points by



● ABOVE LEFT To edit a bone's falloff in *Animation:Master*, select the spline to be affected by the bone and hide all other splines. Now right click the bone and select 'Compute CP weights'

● ABOVE RIGHT As you can see, the bone now only affects the required spline. This is faster and more accurate than selecting Control Points manually and entering weights by hand

LIGHTWAVE | Rigging a character for easy-peddalling animation

Keyframing a character riding a bike by hand can be quite a chore, but with a little work on your rig you can be up and pedalling in no time. All you need is a

character rigged with two standard IK chains for the legs, and some sort of vehicle that requires your character to pedal it. Parent each of the legs' goal

objects to each of the pedals and your character will bend its legs as the pedals rotate. By using a simple expression on the pedals and the wheels, you can have the character fully animated when the vehicle goes forward, simply by moving a 'mover' object to drive the action. [WV]



● ABOVE The character rigged for pedal animation



● ABOVE The rig hierarchy (for details, see image on CD)



● ABOVE And here's the smooth-peddalling rig in action

editing its 'pivot' and 'end' percentages. Select the Control Points that you'd like affected by the bone in question, and hide all other CPs by clicking 'H'.

By right-clicking the bone and selecting 'Calculate Falloff', *Animation:Master* then calculates the Control Point weights automatically according to the bone's falloff, and you get a smooth graduation of CP movement the closer you get to the bones. [SF]

SOFTIMAGE|XSI

UNDERSTAND IK PARADIGMS

IK works on quite a different paradigm in *XSI* to other 3D packages. To get a hand or foot to stay in position, put a pose constraint on the end effector of the chain and key IK blend at 1. Another simple way to get a more traditional 'sticky type' IK is to drag the end effector out of the chain. Do this in the Explorer and you'll see that the end effector is now parented under the scene. Then, selecting the first joint, press [Ctrl] + [R] to open the Kinematic Chain

MANY USERS DON'T REALISE JUST HOW QUICK WEIGHT-MAP CREATION CAN BE IN LIGHTWAVE

properties. On the Kinematic Chain tab you can set 'Force IK' to 'On'. Do the same for 'Affected By Last Bone' and 'Link with FK/IK Blending'. [AL]

HASH ANIMATION:MASTER

GET YOUR CP WEIGHTS MOVING

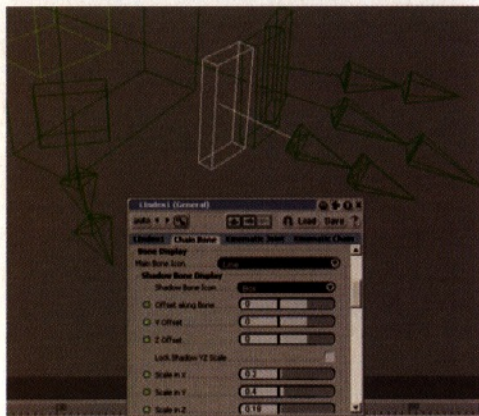
If you find that some CP weights don't move exactly as you wish, you can edit them manually by selecting the Control Point, right-clicking and choosing 'Edit CP Weights'. In the resulting dialog box, select the bones whose percentage weight you would like to change and enter a new value. This process can be done at any time, so if you find that during

an animation a particular pose is not quite working due to the movement of one or more CPs (be it in an action, choreography or pose), you can quickly and easily enter new percentage data to correct the problem. This makes the refining of the characters' poses very easy to correct, even after you have rigged the character. [SF]

LIGHTWAVE

SIMPLIFY YOUR WEIGHTS

It sounds easy enough, but many users don't realise just how painless and how quick weight map creation can be. When working with a symmetrical character, you can apply one weight map for arms, hands and fingers. The left side is separated from the right by the torso, and they are far enough apart that the bones from one side won't influence the other. If the hand is spread out in the default position and 'Multiply Strength by Rest Length' is active, the individual bones in the fingers and palm are too small to affect geometry outside of its immediate area. By simplifying your weight maps, you can shave massive amounts of time off your rigging process. [WV]



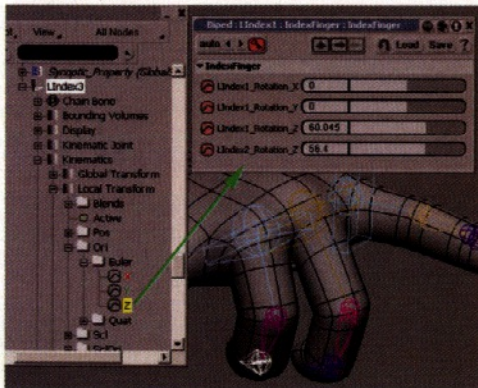
● ABOVE *XSI*'s Isner rigs come with Custom Parameter sets, like the sliders for the finger joints. Setting the hand to display as shown will help you to tweak them (see 'Proxy Parameters')



● ABOVE Manually changing the CP percentage weights in *Animation:Master* is a case of right-clicking the CPs in question and entering new percentages. This can be done at any time



● ABOVE An example of simplified arm weights in *LightWave*. When working with a symmetrical character, one weight map can be used for both arms, hands and sets of fingers



● ABOVE Creating custom parameter sets for *Softimage|XSI*'s Isner rigs will allow you to create a nice simple control for an entire finger housed on the first joint: for details, see below

SOFTIMAGE|XSI

PROXY PARAMETERS

You can add custom parameters to the fingers of the Isner rigs – or rather, proxy parameters. The difference is that proxies actually animate the joints, therefore giving you curves on the joints themselves, which is nice, and simple when it comes to exporting.

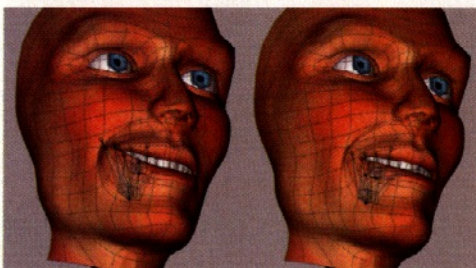
Create a custom parameter set: select the index finger first joint, and in the Animate Panel, go to Create > Parameter > New Custom Parameter Set. Call it 'IndexFinger'. Open the C-prop set from the Explorer and lock it open. Now you can simply drag and drop the parameters you want from an Explorer onto the C-prop set. That includes the X, Y and Z rotations for the first joint itself and the Z rotations for the other two joints in the finger. You have a nice, simple control for the whole finger, housed on the first joint. [AL]

HASH ANIMATION:MASTER

SCALE BONES TO SUIT THE FACE

Once CPs are assigned to bones, poses for different mouth shapes can be created. However, there's a tricky problem that can occur with using weighted CPs in this way: if the arc of the bone doesn't follow the line of the face, you can end up with a bulging section.

The solution here is to scale the bones to line up appropriately with the face. You need to rotate the bone to the extreme point of the pose, and then scale it. Scale it at only one point; if you scale at a number of points, the resulting spline interpolation of the bone can produce unexpected results. [SF]



● ABOVE When the rotation of a bone doesn't follow the line of the face, inappropriate bulging can occur. This is simply fixed in *Animation:Master* by scaling the offending bones

LIGHTWAVE | Bone chains versus cloth dynamics

I'm a massive fan of *LightWave*'s dynamic tools, but they aren't always the answer. When animating a character with a dress or cape, it's sometimes much easier to use bone chains instead of cloth dynamics, as they can make light work of cloth animation.



● ABOVE A bone chain placed through a cape

Simply create a bone chain that runs the length of the article of clothing, apply IK if you wish, and you're now ready to animate. Don't forget that you can pose all the bones at once, which really speeds up the animation process. [WV]



● ABOVE The cape's bone chain in action, working a treat

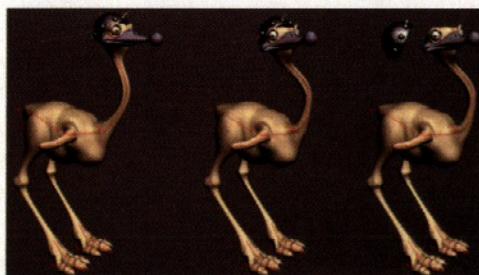


● ABOVE A weight map for a character's helmet in *LightWave*...

LIGHTWAVE

USE WEIGHT MAPS TO KEEP A NEAT AND TIDY SET-UP

If you have a character that has accessories (such as a helmet, sword, purse or football) that need to stay locked to it at times, but also need to be free to move away from the character, you might try making the accessory part of the character object. Using a bone with a custom weight map on the accessory can allow you to separate the object from the character at any time.



● ABOVE ...and here's the helmet rig (see first image) in action

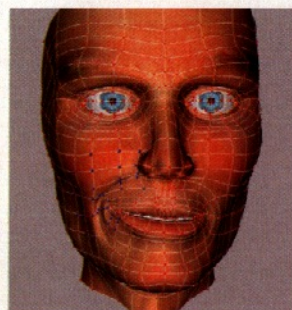
For example, you could have a character with a helmet that wears it for the first half of your shot, and then removes it during the second half. The helmet could have one bone using a specially constructed helmet weight map that is parented to the head bone of the character. The helmet would move with the character as if it were part of the character itself, without having to work with any kind of dynamic parenting set-up. [WV]

HASH ANIMATION:MASTER

CONTROL THE CORNERS OF A CHARACTER'S MOUTH WITH CP WEIGHTING AND MUSCLE MODE

CP weighting can generally give very smooth and accurate mesh distortion. In some cases, however, areas such as the corners of the mouth require extra attention due to the specific creasing required. In this case, create the wide pose of the mouth by manipulating the facial bones appropriately. Click on the Muscle Mode icon and carefully remodel the smile to include a crease.

Remember that manually editing Control Points too much can produce unexpected results when combined with other poses if the CPs are moved too far. This process needs to be done carefully, and it should be regularly tested with other poses to ensure that it works with them. [SF] ●



● LEFT The corners of a mouth often require extra attention in *Animation:Master*. The blue CPs indicate the hand-edited CP positions that were changed in Muscle Mode

TRADE SECRETS

Studio lighting

Create better renders for print ads with this Maya lighting set-up, mimicking that of a real photo studio **BY LEE GRIGGS**

Good advertising work isn't simply a matter of recreating an object in 3D. In the real world, photographers use the intensity and direction of light to reveal the properties of their subject matter: its texture, form, weight, colour, or even translucency. If we, as 3D artists, are to create photorealism in our renders, we must employ the same photographic principles.

In this tutorial, we'll be exploring the process of lighting and rendering product images for print. This will be done by deconstructing how the image on the right – an unbranded shampoo bottle – was created, and examining how the virtual set-up mirrors that of a real-world photo studio.

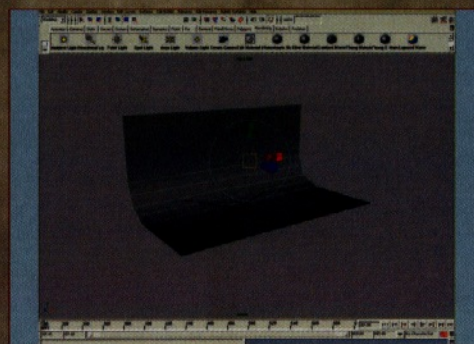
To avoid distracting edges in the background of a shot, studios often photograph their subjects against a curved backdrop. We'll be simulating this by creating and texturing a suitable piece of background geometry.

In order to get a realistic look, we'll be using area lights with raytraced shadows to produce physically accurate soft shadows, similar to real soft boxes. By using Aim constraints, we can ensure that the lights can be moved around the product, without having to worry about whether they're pointing in the right direction. This will also enable us to ensure that the reflections of the lights appear exactly where we want them.

We'll also create a piece of geometry similar to a photographer's reflector behind each light, to which we can assign any chosen texture map. This will give us a visible light source, which will offer more flexibility in setting up lights, and will help achieve optimal reflections in the product itself.

You can find the scene file for the tutorial on your CD. By modifying it to suit your own needs, you should be able to create template set-ups suitable for lighting any product.

Lee Griggs works for ART VPS, advising and training product design, automotive and architectural visualisation agencies. Alias awarded him its prestigious 'Maya Master' title in 2004 [w] www.griggsgraphics.com



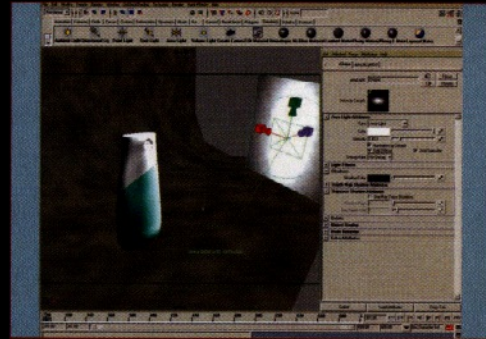
01 First, create the studio backdrop. You can do this by either lofting two NURBS curves or, as in this case, extruding the edges of a polygon. Make sure that the bottom of the backdrop is perfectly flat so that you can sit your product on it. Position the backdrop so the product can be imported at 0, 0, 0. This will make setting up the scene easier because you won't have to reposition every new product that you wish to render.



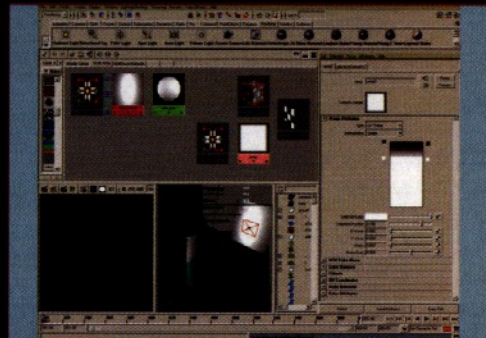
02 Now assign a Lambert material to the backdrop. Create a fractal with a Cylindrical Projection type and connect it to the Colour channel of the Lambert material. Scale and position the place3dTexture node so that it produces an even amount of texture along the backdrop. Now change the colour of the fractal texture to one of your choosing. We've picked two shades of brown.



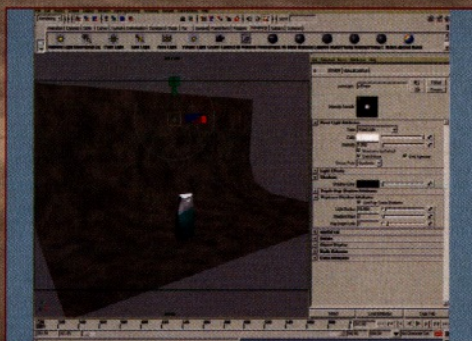
03 Position your product in the centre of the backdrop, which should ideally be at 0, 0, 0. This means you won't have to reposition your products every time you import them into your studio scene. Now assign some materials to your product - we've assigned a Phong to both of the surfaces in this scene. Increase the amount of Reflectivity to around 0.3 so that you can see our lights reflected in your product.



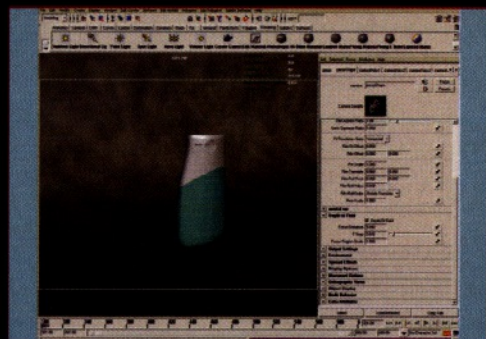
05 Create a locator at 0, 0, 0 where your product is. Create an area light and position it roughly as in this screenshot. Constrain the area light to the locator with an Aim constraint, making sure you pick the locator first. Create another light and constrain it to the locator for the left side, then do the same for the area light above.



06 Create a single polygon and position it slightly behind each area light, then group it inside the area light. To make sure the polygon is visible in the reflections but not the render, turn off Visible in Reflections in the Attribute editor. You can also turn off Double-sided on the Polygon Reflector. Create and assign a Lambert material and increase its Incandescence to at least 0.5.



04 Create a point light and position it above and slightly behind the product. Turn the Decay Rate to Quadratic to give a more realistically attenuating light falloff. You'll have to increase the Intensity to around 3,000 in order to compensate for the change to Quadratic. Switch on Raytrace Shadows and set the Light Radius to 10. This will give you a nice, even light across the backdrop.



07 Select Display > Heads up display > Object details and select the product or locator at 0,0,0. Type this figure into the Focus Distance attribute of your camera and set your F Stop accordingly. If the scene size is too large or small, you might have to tweak the Focus Region Scale in order to see your depth of field. Finally, render the scene, making sure Raytracing is switched on.



● Realistic shadows and reflections help to lock a CG character – such as this Oil of Olay-challenged hitchhiker – within a shot. We'll be explaining how to set them up below

AFTER EFFECTS

Art of darkness

Subtle compositing touches help to sell effects shots like the one above. Follow our guide to adding realistic shadows and reflections to the scene **BY CHRISTOPHER KENWORTHY**

FACTFILE

FOR
After Effects

DIFFICULTY
Intermediate

TIME TAKEN
One hour

ON THE CD

- Full-size screengrabs
- Source movies
- Poser 5 files
- Final animation

ALSO REQUIRED

Additional software such as *Magic Bullet* can enhance the final effect



Things can get a bit complicated if you want to place your 3D character in a real-world situation. When there's glass in your background plate, you'll need a realistic reflection. And if you want a dynamic shot with handheld camera movement, motion tracking will lock your character into place.

Fortunately, the challenges of compositing, such as reflections and handheld background plates, are also its strengths. This example of a clay man sitting in a car – a shot from a commercial video release called *The Dream Sequence* – wouldn't look as good if the camera was locked off: the handheld motion makes the shot seem realistic. Equally, an angle could have been chosen with no glass reflections but, by choosing to show a reflection, you can sell the shot. Adding a believable shadow to your scene is almost impossible, but you can add one that will be perceived by your audience as being realistic: the shadow itself will be so subtle it won't be noticed, but it helps create the illusion that the clay man is actually positioned in the car.

This tutorial shows you how to composite your 3D character into background footage, with realistic motion and motion blur, plus a

moving background. You can create these shots by videoing your car in your garage. Even if you've no intention of doing your own compositing, the information contained within it will still prove useful when it comes to lighting and outputting characters for clients or compositors.

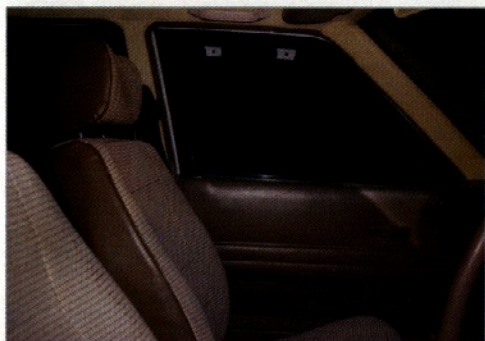
SUPPORTING RESOURCES

This issue's CD (for details, see page 114) contains the *Poser* animation files for the clay man and his reflection, as well as a 3DS single-frame file. To save time, we've also included the completed output footage. *Carshot.mov* is the handheld shot used as a background plate, and *TreeBG.mov* is a blurred background plate created in *Vue 5.0*. The files *ClayModel.mov* and *Reflection.mov* were output as Animation, complete with Alpha channels. You can see the finished shot in *ClayManFinal.mov*.

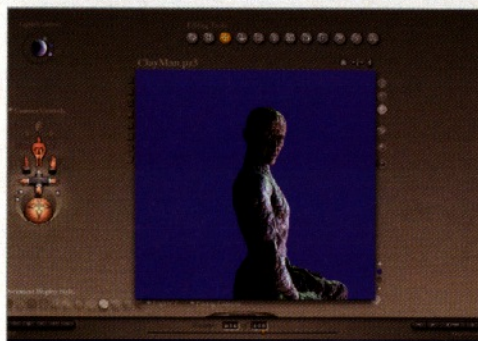
Christopher Kenworthy is a writer and director living in Australia. He's currently working on several film and TV projects [w] www.thedreamsequence.com



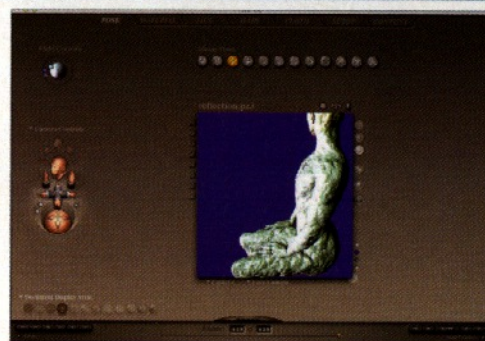
STAGE ONE | Creating files for compositing



01 Your background plate should be shot using black material over the glass to make the window outline easier to see. Stick on two pieces of masking tape, with black dots drawn on, to provide a reference for motion tracking - these should be placed parallel to the floor. If you want, you can also sit somebody in this seat for lighting, reflection and size reference.

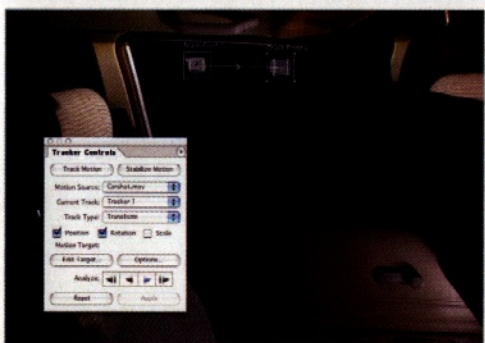


02 Although you can create your model and animation at any time, it's wise to light the model once you've seen the background plate. People in real cars aren't well lit, but there's an accepted movie convention of using strong light from the front, with hard shadows at the back. The car was lit strongly from the front, so do the same with your model.



03 Use the same model and lighting to create a reflection output. Car windows tend to reflect an area from the knees to the shoulders, so position your camera accordingly. Output both animations as a DV Animation with Millions of Colours+. This creates an Alpha channel so, when you import the movie file, the background vanishes and the composite is already halfway there.

STAGE TWO | Anchoring the model to the background



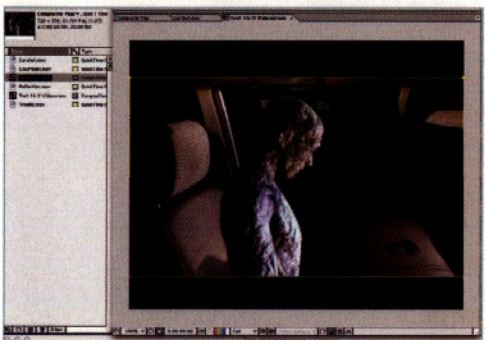
04 With all your files imported to *After Effects*, create a new DV composition and add the Carshot.mov to the timeline. Set the Tracker controls to Track Motion. Check the Rotation box and apply a track point to each of the dots on the window, then click the Track Forward arrow. This records the motion of the camera, which will be applied to all other layers in order to simulate the car's motion.



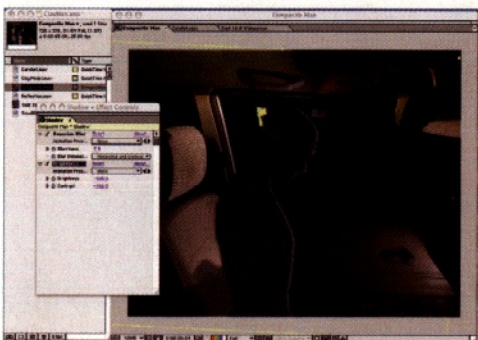
05 Next, drag the ClayModel.mov to the timeline and then Edit Target in the Tracker controls so the Clay Man layer is selected. Click Apply and choose Apply X&Y so that your clay man will move and rotate in time with the background.



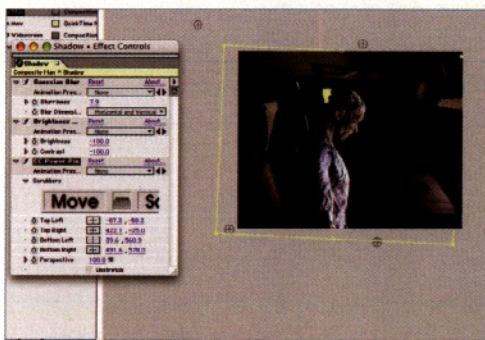
06 Select the Clay Model layer and expand the Transform properties in the timeline. You'll see that Position and Rotation have been set by the Tracker controls, but the clay man is in the wrong place. To move him to the correct place, drag the Anchor Point settings until he appears to be sitting in the right position.



07 Bear in mind that this shot is intended for 16:9 widescreen output, so it doesn't matter if the incomplete lower edge of the man is visible. To test this, create a new composition called Test 16:9, drag your first comp into this new timeline and draw a 16:9 matte box. This can be referenced through the tutorial.



08 Duplicate the Clay Man layer, press [Enter] and rename it Shadow. Apply a Gaussian Blur of about 8.0, and then apply Brightness and Contrast, with both set to -100. Drag the Shadow layer below the ClayModel.mov layer so the shadow will appear behind the clay man, but over the car seat.



09 You can't rotate or drag the shadow into place because rotation and position keyframes control the layer's motion. Instead, apply the CC Power Pin filter and drag the position markers. The shadow should appear to lean backwards, away from the man. Change the Blending Mode to Multiply and reduce Opacity to 50%.

STAGE THREE | Creating a view through the window



10 Drag the TreeBG.mov clip into the timeline, above the carshot but beneath the clay man and the shadow. Click the eye icons for the clay man and shadow to make them invisible, and set the Tree layer Blending Mode to Add so you can see what you're doing as you work.



11 Select the Clay Model layer, press [P] to reveal the Position data, click-drag around all the position keyframes, and Copy. You want to transfer this data to the Tree layer, so select the layer, press [P], make sure the Current Time Indicator is at the beginning of the sequence and Paste.



12 At this stage, if you don't apply rotation data as well, you'll get a slightly different look to your scene. It'll look as though the camera is bouncing around inside the car. For this version, we'll make all the rotations match. Select the Clay Man layer, press [R], select and copy the rotation keyframes and then apply them to the Tree layer.



13 If you play the clip through, you'll see that the Tree layer matches the movement of the car pretty well, but it's in the wrong position. Again, the solution is to adjust the anchor points. Press [A] and drag the anchor settings until the layer covers both of the side windows.



14 When you've dragged the anchor settings until the layer covers both of the side windows. Select the Tree layer and use the Pen tool to draw a mask around the window. You're actually cutting a mask out of the Tree layer, but using the car window for reference. When the mask is completed, the trees will appear to show through the window.



15 Repeat the same masking procedure you performed in step 14 for the rear passenger window. You can feather both of these masks by selecting the Mask, pressing [F] and adjusting the Feather to about 2 pixels, just to soften the edges. However, the window markers are still showing, so to get rid of them, change the Blending Mode of the Tree layer to Normal.

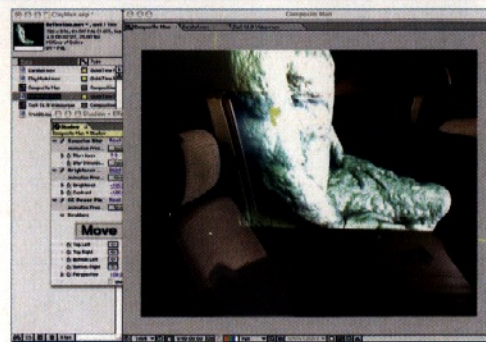
STAGE FOUR | Adding reflections to the glass



16 After you've changed the Blending Mode of the Tree layer to Normal, drag the Reflection layer to the timeline. Make sure you place it above the car and the trees, but below the clay man and shadow. It's also better to keep the clay man and his shadow invisible while you work so as not to confuse things. Set the Blending Mode of the Reflection layer to Add.



17 Using the techniques you learned earlier, copy the Position and Rotation values of the Clay Man layer to the Reflection layer. You can also switch on the Clay Model layer (by clicking the eyedropper) to ensure that the motion of the two clips matches.



18 Select the Reflection layer, press [A] and adjust the reflection anchor points until it's roughly positioned over the window. Most of this reflection will be hidden behind the clay man himself, so you can position the layer slightly farther forward than is realistic. This means that a little more will be visible.



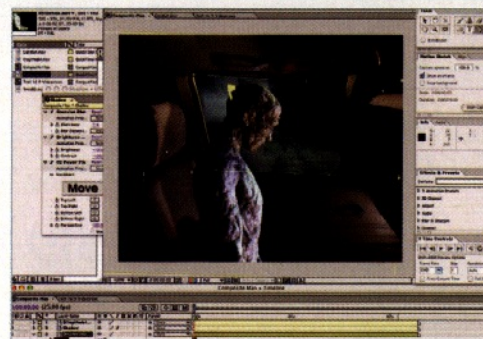
STAGE FIVE | Bringing everything together for final output



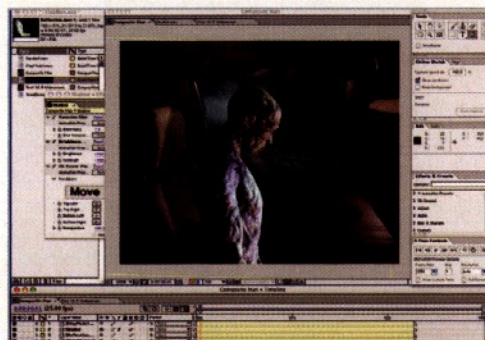
19 Press [S] and adjust the scale of the reflection until it looks more accurate. You'll need to readjust your anchor settings. It's best to adjust the scale with the model in roughly the right place, which is why you anchor, then scale and re-anchor. It seems like a waste of time, but it leads to better results.



20 With the Reflection layer selected, use the Pen tool to draw a mask around the window. Press [F] and feather a couple of pixels. By itself, this reflection, at full opacity, looks unrealistic. Even the angle seems strange, until you check your reference footage of a real person sitting in a car. The next step will bring the required realism.



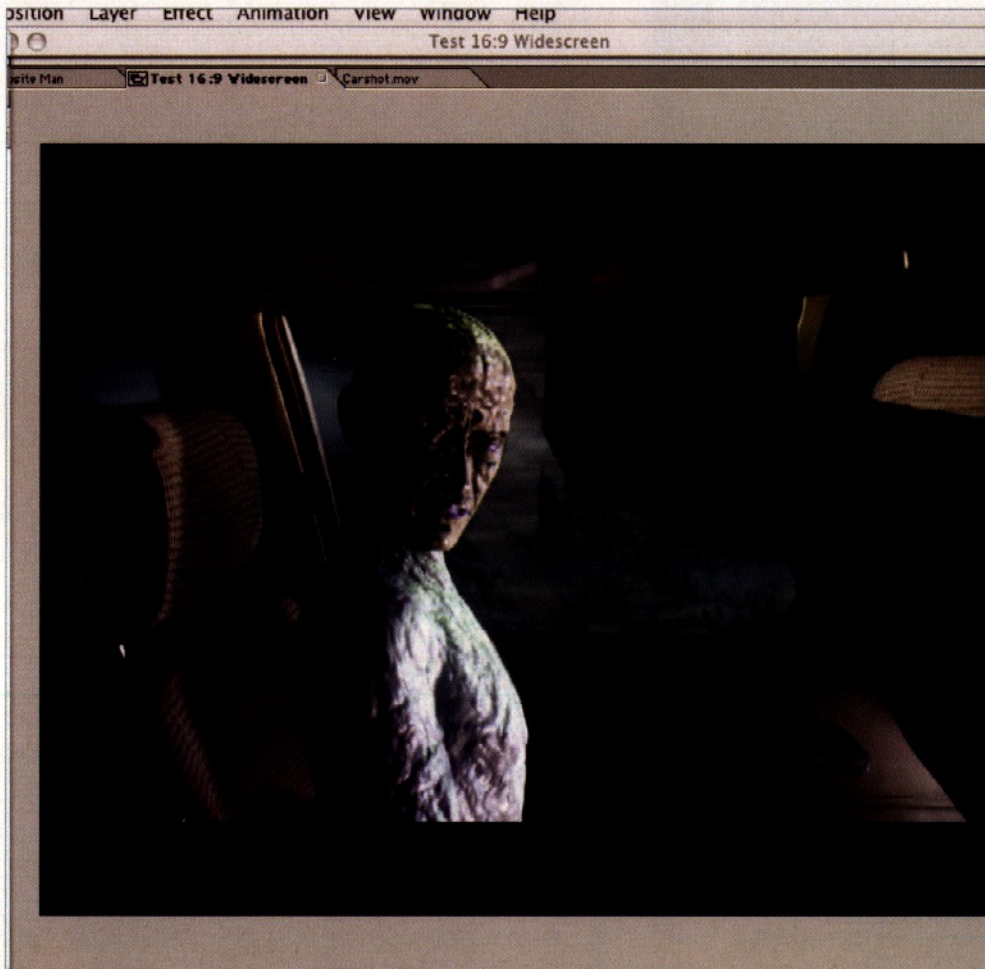
21 Adjust the Opacity of the Reflection layer to about 25%, and change the Blending Mode to Screen. Click the eye icons for the Shadow and Clay Model layer and you'll get a good impression of the end result. A RAM preview will show you how movement, shadow and reflection combine to make the man appear as though he's in the car.



22 Check the M boxes in the timeline to switch on Motion Blur for all layers. Also click on the M button just above and to the right, which will make Motion Blur visible as you work. Motion Blur takes time to render, so it's best to leave it until the end. Another RAM preview will reveal a huge improvement to the clip.



23 You need to letterbox your output to 16:9 widescreen. You can apply a Letterbox filter, if you have one, or go to your Test 16:9 Widescreen comp and use that for your final output. Check that no unwanted edges drift into the frame.



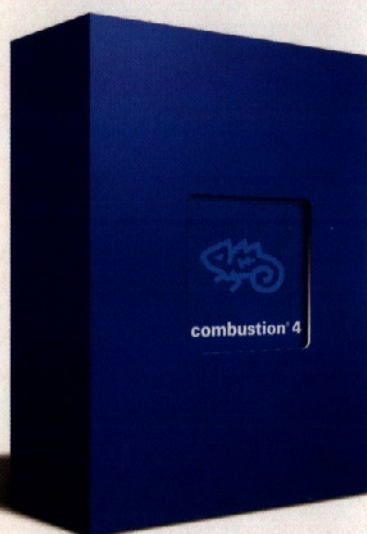
24 Your final output is rarely the final output! To make the composite really work, remember that the colours will have to match other shots in the scene. You should, however, keep a master copy of your output, then re-import this to *After Effects* or your editing application so you can begin colour grading and additional effects. Filters such as *Magic Bullet* (available from Red Giant Software:

www.redgiantsoftware.com) can add a fuzziness and motion blur that gives more of a film effect. This helps to reduce the CG look, and makes the clip blend in better with the rest of your sequence. Although CG and real-world blends are rarely realistic in the strictest scientific sense, you can create an impression of complete realism for your audience with these techniques. ●

3D WORLD EXCLUSIVE

Win a full copy of combustion 4

Enter our competition and you could win a copy of the latest version of Discreet's desktop compositing software, worth £999 - and it's not even in the shops yet!



Desktop motion graphics and visual effects artists can benefit greatly from the powerful new creative features, interoperability, interface and speed enhancements of the latest version of Discreet's desktop compositing software, *combustion 4*. Which is why, this month, *3D World* has teamed up with Discreet to give you the chance to take this powerful app home for free!

With *combustion 4*, artists have access to a complete set of industry-leading visual effects tools. These include 3D compositing, comprehensive motion graphics capabilities, numerous filter and particle effects and advanced colour correction. Also on offer is Discreet's renowned tracking and image-stabilisation technology, powerful vector paint, warping and morphing, text effects, simple editing and advanced animation, expressions and *Flash* output.

Key features of the new release include:

- > The Diamond Keyer, a new level of advanced keying technology derived from *flame*, Discreet's Oscar-winning visual effects system
- > Time-Warp: a fully keyframeable, time-remapping operator for quickly creating slow-motion and speed-up effects
- > B-spline vector shapes and new point-grouping for faster, more efficient rotoscoping operations
- > New optimised 'Fast Gaussian Blur'

- > Custom capsules for creating and saving encapsulated single or grouped operator nodes
- > Gbuffer builder for custom-building Discreet's Rich Pixel Format (RPF) data structures from bitmap files
- > Merge operator: a new optimised operator to quickly merge two layers of the same size using any of *combustion*'s transfer nodes
- > New file import/export options for importing images into colour mixer, importing ASE (ASCII Scene Export) camera targets from *3ds max*, and Open EXR-compatible output

For more information, call Discreet on +44 (0) 20 7851 8000 or visit www.discreet.com. To be in with a chance of winning *combustion 4*, answer the questions below, then email your solutions to martian@discreet.com. The best entry received before 1 June 2005 will win a boxed copy of the Windows version of the software.

QUESTION

Which well-known Discreet visual effects system is *combustion 4*'s Diamond Keyer derived from?

TIE-BREAKER

"I want to win Discreet's *combustion 4* desktop compositing software because..." (complete in no more than 20 words)

TERMS AND CONDITIONS

These rules include any instructions set out in the terms of this competition. By entering this promotion, the entrant will be deemed to have read and understood these rules and instructions and to be bound by them. Employees of Discreet, Future Publishing Limited, or any other person directly connected with the offer or their immediate family will be ineligible to enter. Persons under the age of 18 may only enter with the consent of a parent or legal guardian. Any entry that is incomplete, illegible, late or otherwise does not comply with the rules may be deemed invalid with the sole discretion of the Editor. Proof of sending an entry will not be deemed to be proof of delivery. The winner will be notified as soon as he or she has been ascertained, and the results published on the *3D World* website. The Editor's decision on all matters affecting this offer is final and legally binding. No correspondence will be entered into. Closing date is 1 June 2005.

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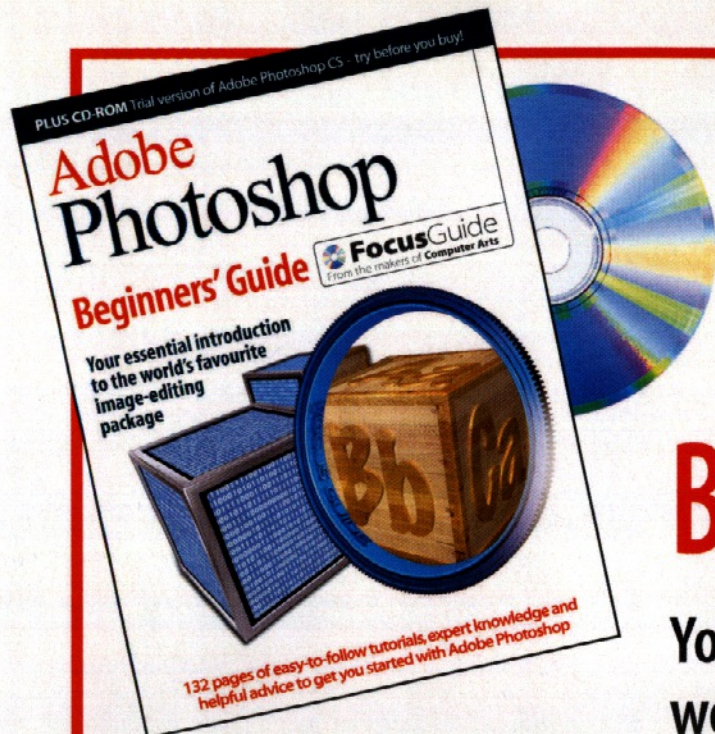
www.discreet.com



● The new Time-Warp feature in *combustion 4* allows users to adjust and animate the speed of a visual effects sequence at any point in the job



● The *flame*-derived Diamond Keyer provides high-precision technology enabling users to create and pull keys with ultimate speed and accuracy



Adobe Photoshop

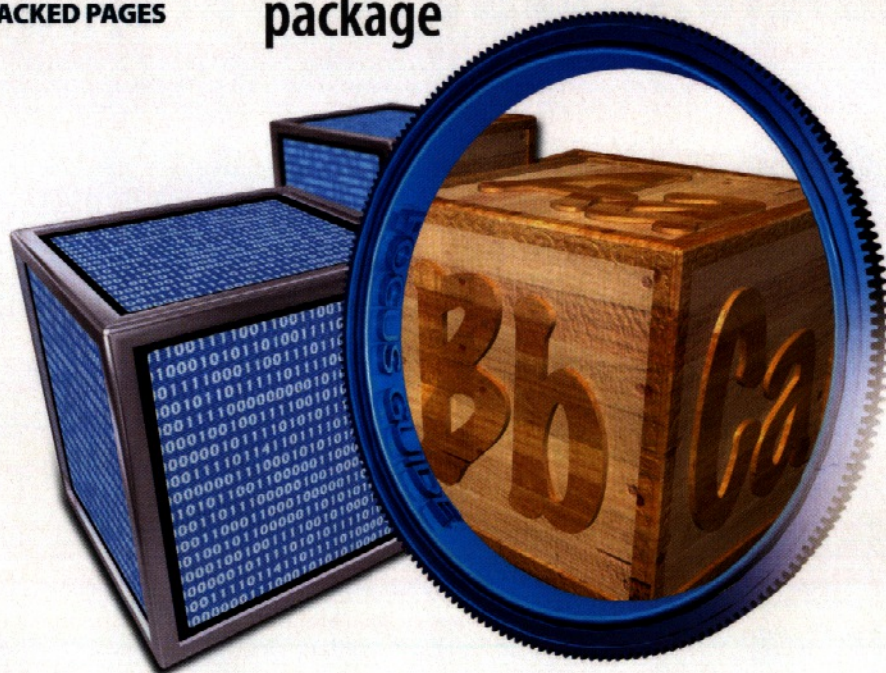
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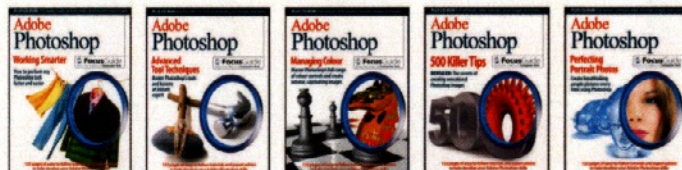


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STALKER

Shadow of Chernobyl

Inspired by a Tarkovsky film and an infamous nuclear accident, the Ukraine's best-known PC game is anything but a standard first-person shooter. It also boasts some cutting-edge 3D BY JON JORDAN

Last year was a turbulent one for Ukraine. Protests on the streets of Kiev over alleged vote rigging shut down the government for months, while the facial transformation of pro-

Western presidential candidate Viktor Yushchenko from leading man to B-movie monster suggested a Cold War-style poisoning. Yet for all the tensions implicit in such a national reinvention, visitors to the country may detect a strong atmosphere of pride and optimism, particularly among the younger generation, which has grown up looking towards the West for inspiration.

One shining example of such determination is found at the offices of developer GSC Game World. Already the most successful game studio from the former Soviet states, thanks to the multi-million sales of real-time strategy game *Cossacks*, it's looking to make its mark on the world stage with first-person shooter *STALKER* (for some inexplicable reason, it's officially called *S.T.A.L.K.E.R.*, but for our purposes *STALKER* will do). It's one of the most ambitious titles under development anywhere - and if nothing else, it demonstrates how quickly what were once viewed as developing countries can break out of the 'cheap labour' ghetto. "I know it's not a modest thing to say, but we are going to be the best," says one of

STALKER's artists, when 3D World visits GSC Game World. Not the sort of talk you'd hear from any other developer, even after several glasses of vodka. But spoken with pride, not boastfully, there is no doubting the sincerity behind the claim. "I know it is like a heavyweight boxer saying he is going to kill his opponent

before the fight. We respect developers like Valve [creators of the *Half-Life* series] and id [*Doom/Quake*], but we have the drive and passion to be the best," he continues. "One day we'll be rich and comfortable, then someone else will become better than us, but with *STALKER* we are going to the best."

This attitude comes as no surprise to Mike Gamble, who signed the game to US publisher THQ. The company's Head of European Product Development, Gamble says the project stood out at an early stage. "I could see it was something special. The sheer detail and realism of the environments caught my attention." Meeting the team only reinforced his instinct. "My first impression was, these guys are probably mad enough to pull this off," he recalls. And throughout the subsequent development process, nothing has changed Gamble's opinion. "Everything they said they would do, has been done," he says.

FACTFILE

PROJECT
STALKER: Shadow of Chernobyl

FORMAT
PC

DEVELOPER
GSC Game World

WEBSITE
www.stalker-game.com

TEAM SIZE
Began with nine, grew to 18 (inc. five programmers and eight artists)

SOFTWARE USED
3ds max, LightWave, Maya, plus internally developed proprietary X-Ray game engine

BACK IN THE USSR

For all the forward-thinking drive of the development team though, *STALKER* draws heavily on the Soviet era. It's based loosely on the classic 1979 arthouse film by Russian director Andrei Tarkovsky, merging the disturbing atmosphere of *The Zone*, a paranormal area created by a falling meteorite, with one



● Based on a film and set around the Chernobyl power station, PC title *STALKER* from GSC Game World promises a hyper-tense brand of realism

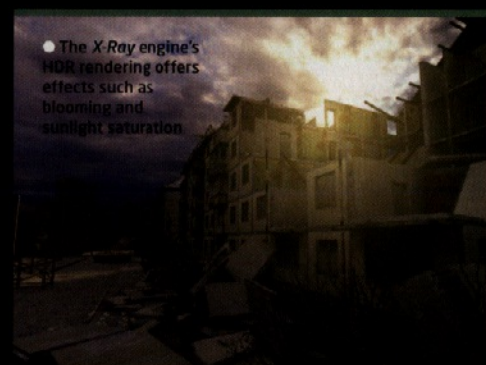


**"I ASKED THE ARTISTS TO
MAKE SOMETHING THAT
LOOKS LIKE IT COMES FROM
A MOVIE, NOT A GAME."**

ANDREI PROKHOROV, LEAD ARTIST



● Based in a deserted landscape called The Zone, *STALKER* features wide-open expanses which are combined with enclosed, claustrophobic game spaces



● The X-Ray engine's HDR rendering offers effects such as blooming and sunlight saturation

of the biggest tragedies in Ukrainian history, the accident at the Chernobyl nuclear power station in 1986. This synergy also provides the game's full official title: *S.T.A.L.K.E.R.: Shadow of Chernobyl*.

With an exclusion zone of 20 miles still surrounding Chernobyl, parallels with Tarkovsky's Zone are obvious. Both are devastated areas, controlled by the military but which have reverted to a level of natural wilderness. Indeed, the development team gained access to the site to take photos and video in order to recreate the buildings and the nearby workers' town of Pripyat, abandoned the day after the accident and uninhabited since.

"I'd had the idea of setting a game around Chernobyl for a long, long time," says Andrei Prokhorov, *STALKER*'s Lead Artist, also known as 'Prof'. "We got permission from the government and went there twice to collect source material. I did have issues with our artists though. They often created models that looked like they were from a game. I asked them to make something that looks like it comes from a movie, not a game. They also had a tendency to make everything look unreal. I had to tell them: 'realism, realism, realism.'" So successful was he in this respect, GSC Game World received a visit from the Ukrainian KGB, interested to know how it had made the

Chernobyl parts of the game so realistic. Even now, visitors to the site aren't allowed to photograph the sarcophagus surrounding the critically damaged parts of the reactor; ostensibly because of fears over terrorism.

Unlike other games (such as *The Getaway*) which trade on their verisimilitude, this is just one element of *STALKER*. Prokhorov says the game is only 60 percent realistic in terms of its environmental modelling - not that this really matters. Compared to the attractions of driving along London's streets, the details of Chernobyl

"THERE ARE SOME GAMES WITH A HUNDRED ARTISTS BUT THEY HAVE NO DRIVE. WE HAVE DRIVE."

ANDREI PROKHOROV, LEAD ARTIST

are far from familiar to the public. Yet there's certainly something sinister about traversing the canals through which water was pumped into the reactors, as well as the frisson of getting close to the looming main facility with its characteristic pylon-like cooling tower, even in a radiation-free virtuality. Another reason for not

attempting complete modelling is that Chernobyl is huge. One level artist claims just this one part of the game is bigger than the whole area of Valve's recent best-seller *Half-Life 2* - despite the game's real-world equivalent 30mph running speed, it still takes 20 minutes or so to circumvent the main reactor building.

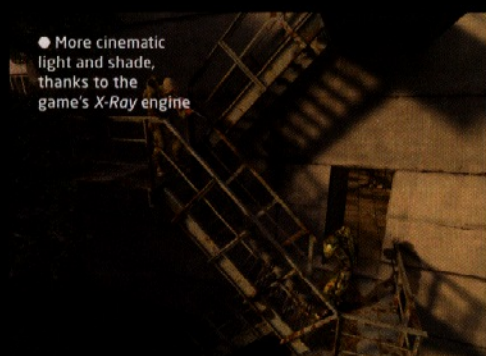
As for the attractions of Tarkovsky's film, Prokhorov says it was all about the atmosphere. "*STALKER* is an atmospheric game. It's not the usual shooter where the goal is to go and kill everyone," he says, explaining that combining film and location made it easy to make what he hopes will be a killer double act: "A very realistic, very atmospheric game".

A NEW AUDIENCE

Issues of content creation and gameplay aside however, the most impressive aspect of *STALKER* remains the dedication of the developers. One surprising factor, considering the usual perception of Eastern European team sizes, is how few they actually are. Initially involving a mere nine developers, this has since grown to 18, including five programmers and eight artists. There's also the issue of the team's relative inexperience; most have worked on only one other game. However, their Soviet education, which concentrated on the technical arts, is an advantage. "Many of our programmers have two degrees, with a particular concentration on maths and physics," says Prokhorov, who himself has a PhD in Aeronautics and previously was an aircraft designer. "My parents were professional artists, and it's long been my dream - so I'm happy to be [following in their footsteps]." Most of *STALKER*'s other artists have studied at a high level at art



● The Zone is populated by hordes of mutated creatures, warring clans of Stalkers, as well as elite military forces. Another danger are the deadly electrical and gravitational anomalies



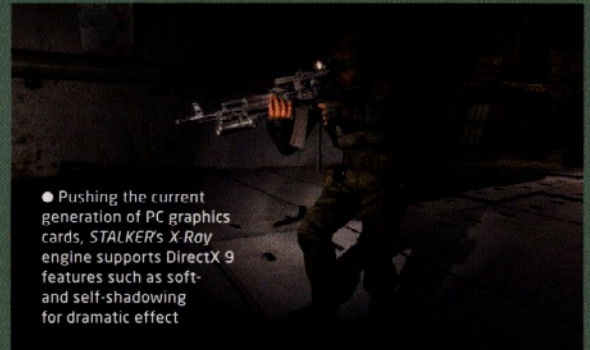
● More cinematic light and shade, thanks to the game's X-Ray engine

INNER STRENGTH | Behind every great FPS is a great engine. STALKER's is called X-Ray

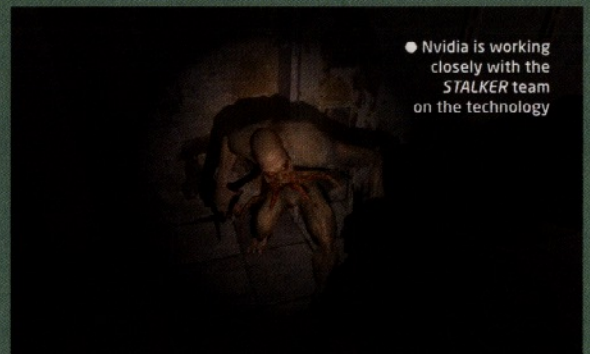
As with the developers of most PC-based first-person shooters, GSC Game World is intensely proud of the engine behind *STALKER*. Written internally, the X-Ray game engine is a powerful suite of technologies consisting of components ranging from rendering to animation, physics, Artificial Intelligence, audio and networking. Its core, however, is graphics. Optimised for two versions of Microsoft's gaming API, DirectX, the lower-spec renderer supports the partial programmability of DirectX 8.1 graphics cards such as Nvidia's GeForce3 series. At this level, X-Ray supports a polygon throughput of around 300,000 polygons per frame at 60 fps. Much work has been carried out optimising X-Ray for the current DirectX 9 standard too, which enables a tenfold increase of around 3 million polys per frame at 60 fps. It also allows the engine to support many of the new per-pixel shader rendering techniques required for the modelling of complex light-material interactions. These include High Dynamic Range lighting, which is used to generate bloom effects when moving from extreme darkness to light. Other features

are dynamic soft shadowing, support for hundreds of real-time lights, and the real-time calculation of umbra and penumbra shadowing. Post-processing of the frame buffer can be carried out to generate non-realistic chromatic distortions as well.

But X-Ray isn't only about rendering. It includes a skeleton-based animation system, which is designed to handle both motion-capture-generated data and hand animation. Mo-cap was used for some of the human characters, but much of the animation was hand created. Other subsystems include in-house tools such as a level editor, a particle creation tool and an actor editor. Perhaps the most surprisingly aspect of X-Ray, though, is its impact on the artists' content-creation tools. Unlike other developers, GSC Game World doesn't standardise its pipeline around one single modelling and animation package. Instead it allows artists to choose between *3ds max*, *Maya* or *LightWave*. "We can export from any of those apps straight into the engine," says Andrei Prokhorov. "It makes it very simple for the artists as they can choose their favourite package and we don't have to teach them how to use our engine."



● Pushing the current generation of PC graphics cards, STALKER's X-Ray engine supports DirectX 9 features such as soft- and self-shadowing for dramatic effect



● Nvidia is working closely with the STALKER team on the technology

academies. "There are many talented artists in Ukraine and Russia. We have no problem recruiting artists, but we only need eight at the moment," Prokhorov says. "There are some games with a hundred artists, but they have no drive. We have drive."

According to Mike Gamble, it's this heady mixture of technical expertise and inexperience which sets *STALKER* apart. "Eastern European developers are clearly the technical equals of anyone in the world, but because they haven't been exposed to the Western way of doing the business of computer games, they take a fresh and interesting view," he says. "One example with *STALKER* is the way they've approached its design and development. Nothing is ruled out because received wisdom says it's not possible, or doesn't fit the genre."

This is particularly true in terms of moribund first-person shooters, yet *STALKER* expands the genre by incorporates elements of role-playing games. Starting out as a weak individual,

players have to fulfil simple missions in order to acquire and trade the equipment that will enable them to enter more dangerous parts of The Zone. The game has a complex social model, with actions being reflected in their relationships with the various Stalker clans operating in The Zone. Players will have to maintain their physical well-

being by eating and sleeping regularly too. And most radically, there's also the possibility that the game's perceived goal – being the first Stalker to enter The Room – could be achieved by one of the computer-controlled characters; something unlikely to sit well with the conservative nature of the average PC shooter gamer. "To be honest, the premise and nature of the game have caused enormous headaches from a quality-assurance perspective," says Mike Gamble. "Never has the

"STALKER'S GOAL IS NOT TO GO AND KILL EVERYONE. IT IS A VERY REALISTIC, VERY ATMOSPHERIC GAME."

ANDREI PROKHOROV, LEAD ARTIST, STALKER

question "Is this a bug or a feature?" been more pertinent than with *STALKER*. There's also the issue that the technical and design expertise of the GSC team far outstrips its production expertise, which makes the management of what is already an ambitious project even more difficult.

Of course, until the game is finally released, it will be hard to judge the extent to which GSC Game World has fulfilled *STALKER*'s obvious promise. But what isn't in question is its commitment and talent. The days of dismissing countries like Ukraine as only being good for cheap outsourcing are over. Now it's competition time: and everyone is in their sights.

STALKER is being developed for PC only and is currently scheduled for a May 2005 release.
[w] www.stalker-game.com



● This helicopter is the model for Richard Smith's 2D retro game *Rescue Blade*. Although it's in 2D, Richard used *LightWave* for the origination of all the graphics

Richard Smith

Richard Smith is a one-man Shockwave machine. He not only comes up with the ideas for the games he creates, and does all the graphics and sound, but he also provides the silly voices...

BY BEN VOST



● Another *Rescue Blade* image. You may have rescued all those sailors, but it's not looking good for your helicopter...



● *Hurtle Turtle* was the first online game that Richard Smith created. He used *Shockwave* and *LightWave 3D*

Tell us about yourself

I work from my home-based studio, just north-west of London. I started out creating hand-drawn 2D graphics for Amiga games, but everything after that's been 100 per cent *LightWave*. After a stint at video editing and special FX, I soon got into *Shockwave* and Flash 2D web programming, ultimately working for an advertising agency in London. My *Ericsson T20* game won the 2001 Advertising Clio Statue. I then took a year out to create my little *GameBombs*: a series of three CD-ROMs for children, each in their own plastic BombPod, which made it to the UK shelves in Christmas 2002.

How did you get into 3D?

With the advent of *Director 8.5* and *Shockwave 3D*, my dream came true: *Shockwave* web content with full access to Direct 3D and OpenGL. When NewTek brought out the best *Shockwave 3D* exporter for any package (including weight mapped bones!), I couldn't believe my luck. I dived headfirst into the 3D web game scene and got a lucky break with *Hurtle Turtle* at www.shockwave.com/sw/content/hurtleturtle. From there I did quite a few 3D commissions and ad-based web games, plus a few projects for the super-cool Swiss firm Nothing From Outer Space (www.nothing.ch) and UK-based peripheral firm, In2Games.

Where can we see your latest work?

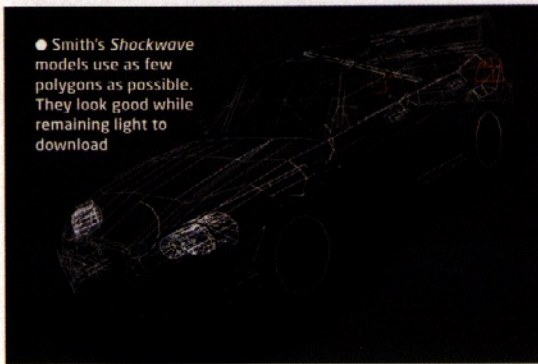
My latest 2D work, *Rescue Blade* (www.shockwave.com/sw/content/rescueblade) is a retro game with pre-rendered graphics. It's a real old-style, sprite-based effort, but great fun (dunk the cable guy for a surprise!). My latest 3D title is *Battle X* for Mattel (www.shockwave.com/sw/content/battlex). *LightWave*'s excellent UV mapping enabled very efficient use of the limited texture allowance for this title. I'm particularly proud of the weapon chain rack.

When did you start using LightWave?

I was introduced to *LightWave* thanks to my mentor Gary Fenton, who had it running on his good old Commodore Amiga (sigh...) I first used it on the PC for MTV music video visuals around 1995. It has a steep learning curve, but it's well worth it in the long run. I create the real-time models, textures, sound effects, silly voices, code, physics and music myself, so I'm very self-contained. I think working as a one-man band avoids a lot of the communication problems I've encountered as part of a freelance team in an office environment.

What do you like about the package?

You can get stuck in up to your elbows with the poly/vertex-level editing – it's much better than other packages I've used. The



modelling tools are unbeatable for hand-building real-time, low-poly content. It also has an amazing feature set for the price tag.

What could be improved for you?

Definitely the logic of the menu access for some features, and integrating some of the more essential plug-ins would help. More up-to-date certification for workstation graphic cards and drivers would be good, too.

What spec machine do you use?

I use a P4 (2.4GHz, 1GB) Quadro4-based rig, which is more than ample for my real-time models, along with a load of older machines for testing.

What plug-ins couldn't you be without?

Shockwave 3D Exporter!

Do you play a lot of games?

Well, I'm either making them or playing them! I must have played a worrying number of games on the C64 and Amiga. My favourites are the wickedly amoral *GTA III* or *Vice City*. On the Commodore C64, it was *Wizball*, on the Nintendo 64 it was *Super Mario 64* (ignore the sickly cute exterior to reveal ultimate gameplay mechanics) and *Goldeneye* (far better than the latest Bond games), and I also like *Ratchet & Clank 1* and *2* (great humour)

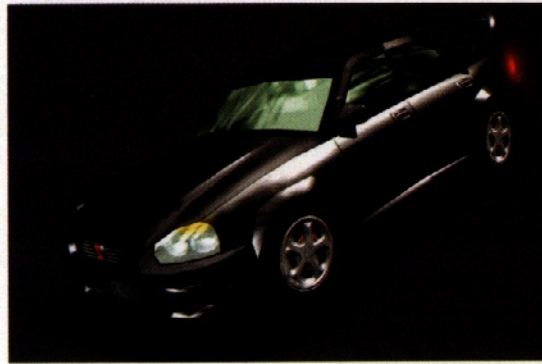
What Amiga titles can we associate you with?

I worked for Audiogenic, and here's my list of shame: *Wembley International Soccer* (12 bazillion hand-drawn sprite frames - aaarrgh), *Bubble and Squeak 2* (end-of-level baddies and some backdrops), *Super Loopz* (backdrop animated characters), and *Exile* for the Amiga 1200 (parallax backdrops).

How do you go from concept to game?

There are certain steps involved in moving from a sketch to a full game on something like Shockwave.com. This is the format it usually takes:

1. Brainstorm unintelligible scribbles into my latest ideas book.
2. Suggest a big range of ideas for the client to choose from.
3. The client wants ALL the ideas with no extra time.
4. Panic...
5. Create the real-time models and weight maps, making sure I count every polygon.
6. Create the *Photoshop* textures and bone any characters.
7. Export the w3D file.
8. Code the game in *Director*.
9. Add sound effects.



10. Add music, menus and score submission.

11. Publish to Shockwave web format.

Tell us about the game you won a Clio for

It was an Ericsson T20 promotional webpage (not a mobile-phone game). It had a dizzy teeny girl rushing around a house collecting items that her friends had left behind, then finding the nightclub and handing them out. Avoiding the mad landlady and crazed pets was the best bit. I did about ten different voices for the project. I think humour can really make a difference to how people warm to the game.

Which of your games can be played online?

I noticed that *ZipZaps* and *InitialD* are not live any more, probably due to contract licence stuff, but here's a list of the live ones and when they went up:

Hurtle Turtle (June 2002) My first ever 3D attempt
www.shockwave.com/sw/content/hurtleturtle
Redline Rumble (August 2003) A *2 Fast 2 Furious* game with licensed shells
www.shockwave.com/sw/content/redline_rumble
Redline Rumble 2: Detonator (March 2004) Innovative use of boned road segments
www.shockwave.com/sw/content/rr2detonator
Rescue Blade (July 2004) Simple but fun 2D rendered graphics
www.shockwave.com/sw/content/rescueblade
Battle X (January 2005) my most ambitious 3D title to date!
www.shockwave.com/sw/content/battlex

What are "boned road segments", as in RR2?

Creating a track of huge length in one mesh would bog the system to a crawl and take forever to download. So I invented a cool system where I create small segments of road with Segment Weight maps, and add a spine of bones that I can use to bend the road segment to any angle or incline in real time. By chaining a few of these together and leapfrogging them in front of the player, a huge varied track can be created in a tiny download.

What are you working on now?

I've just completed a 3D commission for a major toy company (Mattel), and I'm now in the research stage of a martial art title. It's nice to mix my own personal games with the more serious commercial projects.

The best thing about my job is the huge variety, and the satisfaction of having created something purely by my own efforts. The worst aspect is the constant battle to shoe-horn a full 3D game into a 1MB file, as well as keeping all the PC hardware and OS combinations running smoothly. But working seven days a week to tight deadlines with no one to delegate to is not recommended! ●



● Richard's racing title, *Redline Rumble 2: Detonator*, uses bones to create long varied tracks from small amounts of geometry



● Over a dozen different car models, plus the background detail, needed to be created in as low a resolution possible



● *Hurtle Turtle* was exported using the Shockwave exporter, which has been built into LightWave since version 7



● Richard's newest game, *Battle X* for Mattel, features 'whirling blades of death' in a futuristic 'arena of doom'. No, honestly

MORE INFORMATION

See Richard's latest work at Shockwave.com: <http://www.shockwave.com/sw/content/battlex>, and visit the thriving Shockwave section on NewTek's forum: <http://bulletin.newtek.com/forumdisplay.php?f=29>

ABOUT THIS ADVERTORIAL

This story was created by NewTek Europe in partnership with 3D World magazine. Read the full version in the Community section of the NewTek website www.newtek-europe.com

Q&A

SOLUTIONS / FIXES / ADVICE

● Get your vehicle animations on track with our guide to setting up a working tank tread, complete with realistic sag and bounce

QUESTION OF THE MONTH

Submitted by
Michael van Kesteren

CINEMA 4D

"How do I create a believable tracked vehicle or tank?"

FACTFILE

FOR

Cinema 4D R9 (although B.5 could also be used)

DIFFICULTY

Intermediate

TIME TAKEN

One hour

ON THE CD

- Animation of the final project
- C4D files of setup
- Full-size screenshots

ALSO REQUIRED

corearsenal's JENNA 2.22 (although earlier versions will also work)

This month's answer is supplied by Adam Watkins, Director of Computer Graphic Arts and head of the Animation program at the University of the Incarnate Word, Texas

"Tanks are remarkable vehicles and it's no wonder they've captured the imagination of both vehicle engineers and 3D animators alike. Their form of propulsion – a track driven by cogs and wheels,

running in a set path – drives the huge armoured vehicle almost anywhere, through anything and over anyone. When you view footage of a tank, it's not hard to see what's happening, but that interesting motion makes for some pretty tricky setups when it comes to animating such a mechanical beast.

The problem is twofold. First, how do you get these small, individual tracks to run in the predefined route that the wheels and cogs define? Second, once they do, what can be done to give the sag that this metal chain has at the top of its trip, and how can you get this sag to react to external forces like undulations in the terrain? After all, much of the interest in the way a tank moves lies

in the near organic movement of the top of that track. To solve this multi-faceted problem, we're going to use a wide variety of the tools that are available in C4D. We'll skip the modelling process and move right on to getting a single track to become many, then get those tracks to align around a given path. We'll also look at how to get them to move this the path using corearsenal's JENNA 2.22 plug-in, available free on your magazine CD.

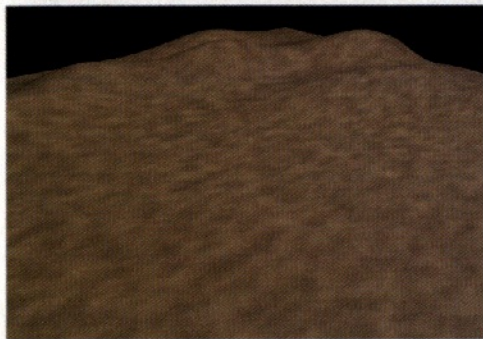
GET TANKED UP

Although getting the tracks to move is a good start, the real magic comes when we give them a bit of a wobble as they travel. This comes from a tool called NICKL, which is nested within JENNA. NICKL is also available as a separate free download from Maxon's website (www.maxon.net).

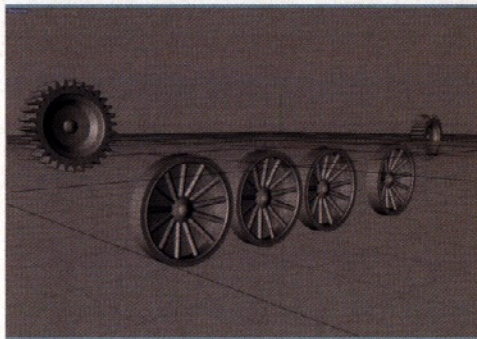
Finally, to make this a really useful setup, we'll use C4D's Dynamics and XPresso tools to create a gravity and mass-driven set of springs that will, in-turn, drive changes in the path that the tracks follow. The result will be a set of tracks that sag and bounce as the tank strikes and rolls over any obstacles in its way."



STAGE ONE | Matching the background plates



01 Set up your scene. How you do this is largely up to you and the look you're going for. This shot made heavy use of the Magnet tool (Structure > Magnet) that allows for the quick creation of undulating hills and surfaces. Make sure you use a variety of Radius settings to get non-uniform dunes in the sand.

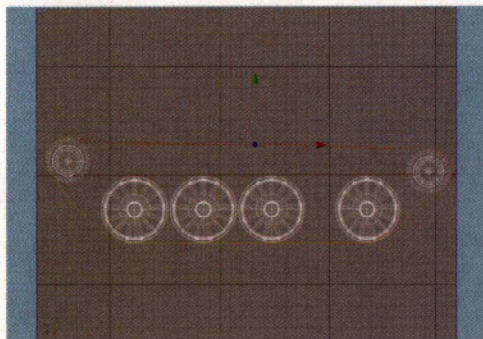


02 Set up the core tank elements. This will include the wheels and cogs. The position of these objects will be important because they'll define the spline, which defines the path of the tracks that we'll be making later. Make sure you've done plenty of research and place these elements carefully. A pre-built scene file for this Q&A can be found on the magazine CD.

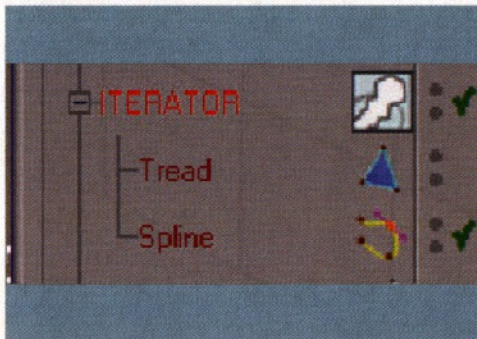


03 Create one track link. Keep in mind that most shots won't see all the loving care you may put into this moving part - this is just one of many tracks that'll eventually be making its way around the path, so make sure that you keep an eye on your poly count. Also ensure that its axis of rotation has the Z-Axis pointed forward, in the direction your track will run.

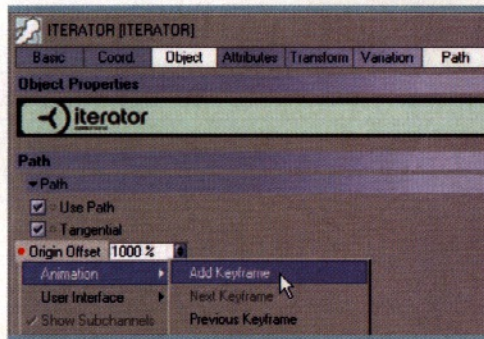
STAGE TWO | Creating the tread and setting up relationships with XPresso



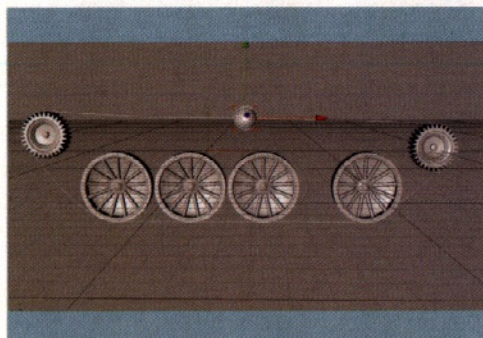
04 We now need to create the spline of the track path. From a non-perspective view (preferably the front), use the Draw Bezier Spline tool to create a spline that will define the path of the tread. Note that you must have at least one point of this curve where the tracks would sag. This point will become very important later on...



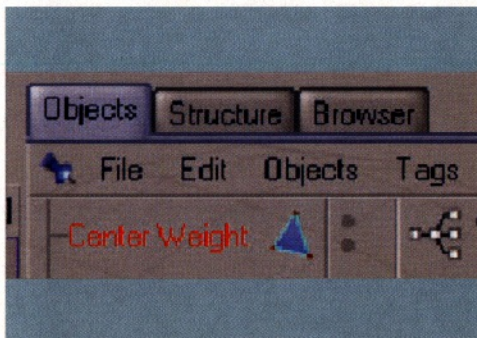
05 Use JENNA to align the track link to the path. Create an ITERATOR object by selecting Plugins > cajenna > Iterator. Place your track link and the spline (drawn in the previous step) as children. In the Attributes editor, you can change how many iterations to use in the Attributes tab. In the Path tab, make sure you click Use Path and Tangential and choose Distribution: Fit Length.



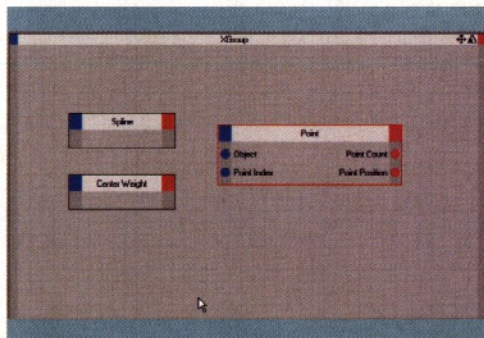
06 To animate the tread around the spline, we can also use the Iterator. Double click Iterator in the Objects Manager and open the Path tab. Right click Origin Offset and choose Animation > Add Keyframe, with your current time marker at 0 frames. Move to another time, change the Origin Offset value (100% is one complete cycle) and click Add Keyframe again.



07 Before we can add sag, we need to set up some relationships. Turn off the Iterator for a moment (click the green checkmark) and create a new Sphere, which will control the spline's point. Make it editable (hit [C] on your keyboard) so you have a polygon object to work with. Position it at about the centre-top point of the spline and name it 'Centre Weight'.



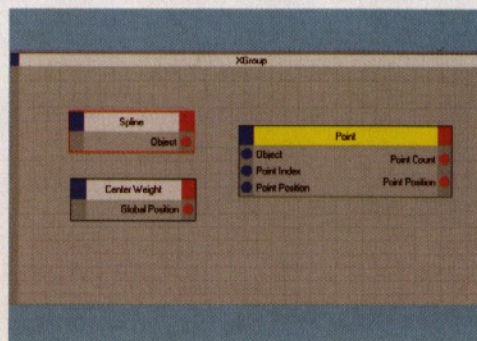
08 We now need to activate XPresso. We'll be using XPresso (C4D's graphical expression writer) to allow this Centre Weight to control the spline. To activate XPresso, right click Centre Weight in the Objects manager and select Cinema 4D Tags > Xpresso from the drop-down menu. Double click this new tag to open the XPresso Editor.



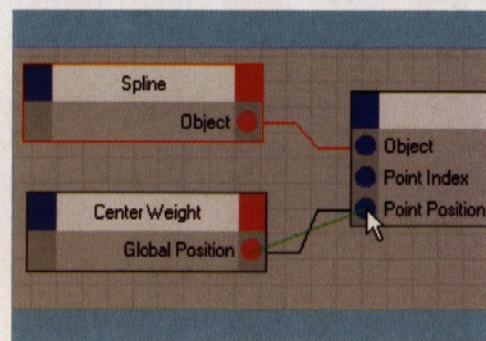
09 Place the players on the stage. Drag Centre Weight and your Spline (the track path) into the main area of the XPresso Editor. We also need to create a node to tell Cinema 4D that we're only affecting one point of the Spline. Do this by right clicking in the XPresso Editor and choosing New Node > Xpresso > General > Point. This will place another node on the stage.

| Point | X | Y | Z |
|-------|-----------|----------|---|
| 0 | -1262.317 | 331.162 | 0 |
| 1 | -1511.514 | -21.364 | 0 |
| 2 | -777.884 | -619.932 | 0 |
| 3 | 1352.404 | -616.863 | 0 |
| 4 | 2101.381 | -73.547 | 0 |
| 5 | 1914.137 | 236.48 | 0 |
| 6 | 321.047 | 277.074 | 0 |

10 In Points mode, select the top-centre point of the spline. Open the Structure manager (nested beneath the Objects manager) and choose View > Jump Next Selection. This will highlight a row. The point's number will be in the first column. Click the Point node in the XPresso Editor and enter this number in the Point Index area of the Attributes Editor's Parameter tab.

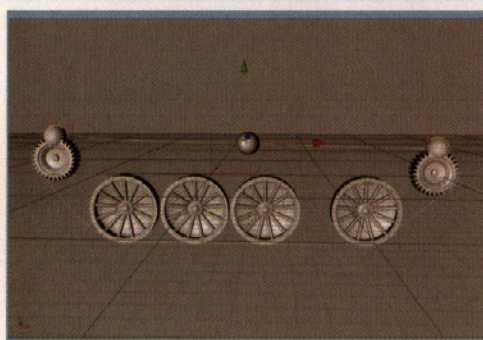


11 Create Inputs and Outputs for all XPresso nodes. These Inputs and Outputs define which parameter will drive which other parameter. For the Point node, click on the blue box (Input) and choose Point Position. For Centre Weight, click on the red box (Output) and choose Coordinates > Global Position > Global Position. For Spline, click on the red box (Output) and choose Object.



12 Now we need to string them all together so that each node knows how it relates to the others. Drag Spline's Object Output (red dot) to Point's Object Input (blue dot). Drag Centre Weight's Global Position Output (red dot) to Point's Point Position Input (blue dot). You'll know when the connection is made because a line will be drawn between the outputs and inputs.

STAGE THREE | Using Dynamics to create the sag in the tank treads



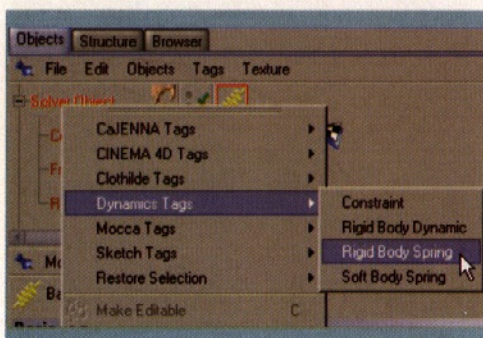
13 Now when you move the Centre Weight, the Spline will deform, which in turn will change the path of the track links. To make the Centre Weight's movement more autonomous, we'll use Dynamics. To do this, create two more Spheres and make both of them editable. Place them as shown in the screenshot above and name one 'Front Anchor' and the other 'Rear Anchor'.



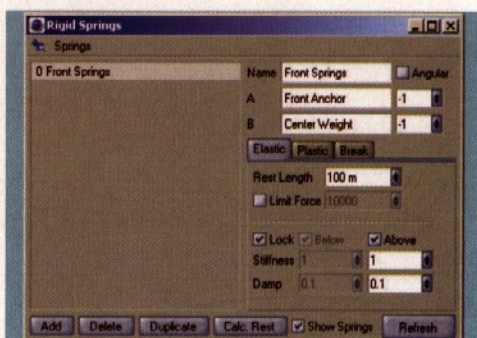
14 Define the objects to be used in Dynamic calculations. Do this by creating a Dynamics Solver object (Plugins > Dynamics > Solver Object). Place all three spheres as children. Choose each of the spheres and add a Rigid Body Dynamic tag by right clicking and choosing Dynamics Tag > Rigid Body Dynamic from the drop-down menu that appears.



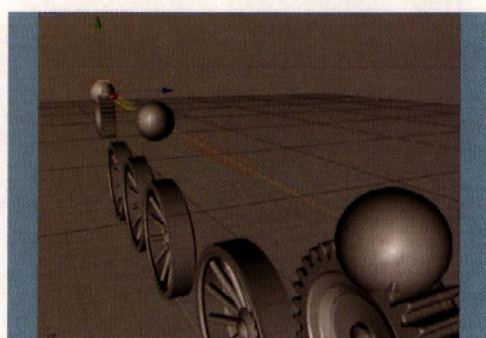
15 Adjust the Mass. The two anchors need to stay floating in space - they'll be attached to the cogs later. The Centre Weight needs to maintain some weight because it'll be reacting to the movement of the tank. Select the Rigid Body Dynamic tag for Front Anchor and, in the Mass tab, turn the Total Mass setting to 0. Repeat for the Rear Anchor. Leave the Centre Weight's Mass unchanged.



16 Create Springs for the Centre Weight. Somewhat counter-intuitively, you define the springs for this dynamic scenario on the Solver Object. Right click the Solver Object in the Objects manager and select Dynamics Tag > Rigid Body Spring. This will open a new window that'll enable us to create and edit springs between the objects within this Solver Object.



17 Create individual springs. In the Rigid Springs dialog box, click on the Add button. In the Name Input field, enter Front Springs. Drag Front Anchor from your Objects manager into the A Input field, then drag Centre Weight into B. This creates a spring from Front Anchor to Centre Weight. You'll now see an indicator of a spring in the Editor window.



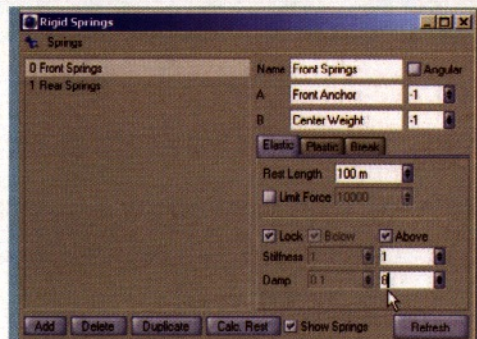
18 Repeat this process to create the Rear Springs. Again, hit Add to create the new spring. Name it 'Rear Spring' and bring Rear Anchor into A and Centre Weight into B. In both this and the earlier spring, you can leave all the settings on their default values. The -1 value after the A and B input fields indicates that you should use the centre of the objects as the anchor of the spring.



STAGE FOUR | Adding the final touches



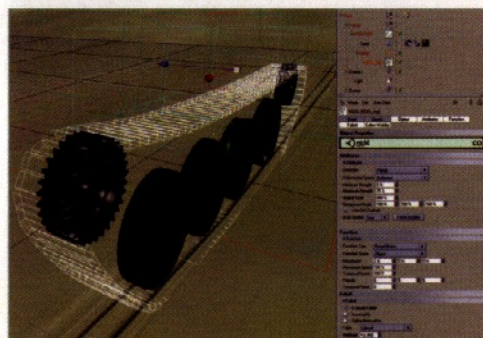
19 Add Gravity (Plugins > Dynamics > Gravity) and hit Play in Animation Controls to see that the dynamics are working (just a slight bounce in the Centre Weight). Test how the setup works in animation by animating the Solver object over a few seconds. Note that you may need to change the Solver Object's settings in the Attributes editor if you want to see more than the default 90 frames.



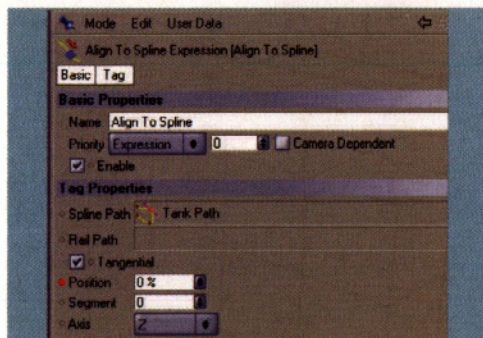
20 You may find that if you're moving quickly, your Centre Weight will go ping-ponging back as the front spring stretches too much. Double click the Rigid Body Spring tag (attached to the Solver Object in the Objects manager) and, in the Rigid Springs window, select Front Springs. Turn the Damp setting up to something like 8. This will make the spring not quite so 'springy'. Test and adjust.



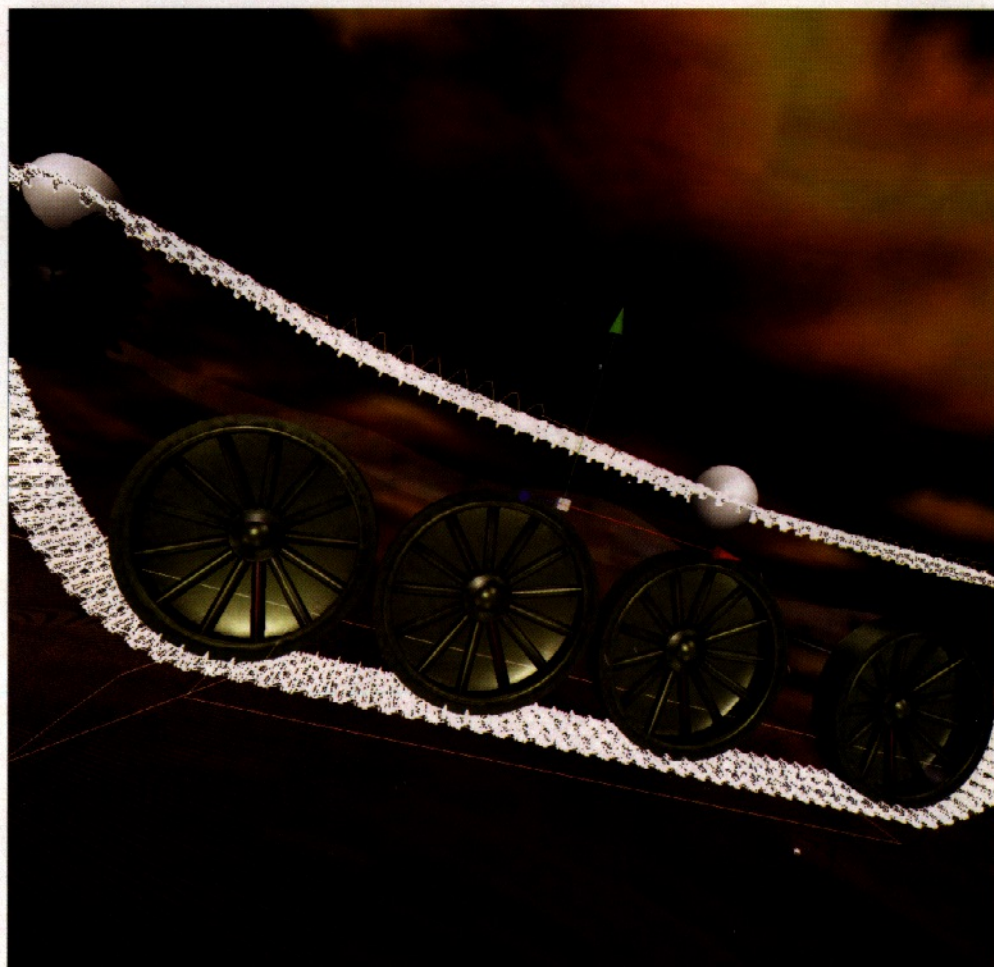
21 Delete your test animation keyframes. As we reach the endgame, the organisation of things will become important. Select your cogs, wheels, Solver Object and Iterator - basically everything that's part of the tank treads - and group them together using [Alt] + [G]. Rename this new group 'Tank'. This group is what will be animated to make use of the dynamics.



22 Now to add the wiggle for that little bit of extra pizzazz. NICKL is a free plug-in that makes organic deformations. Select Plugins > Cajenna > Nickl. Make the new NICKL object a child of the Spline (which is a child of Iterator) and position it so that the top of the spline runs through it in 3D space. For detailed settings, see the full-sized screenshot on the CD.



23 To animate, draw a spline that defines the path you want your tank to travel along (including hills and bumps) and name it 'Tank Path'. Move your tank object's axis to where the treads impact the ground. Right click the Tank group and select Cinema 4D tags > Align to Spline. Click this new tag and drag Tank Path in the Spline Path input field. Animate via the Position input field.



24 And that's it - our vehicle tracks are now completed. Some final touches that you may want to add could include an animated Boolean that reveals a track in the sand. The final render and file on this issue's cover CD includes a few emitters that give out Visible Lights (no Light Illumination) to mimic dust flying in the air. Rather than having a high rate of emission using smaller lights, make sure

you work with fewer lights and add some Noise to the Visibility. Although this screenshot shows the dynamics objects we use to distort the tracks, you actually need to hide the construction objects that you don't wish to show in the final render. This includes elements such as the Solver Object, various splines and so on. Make sure you hide them in both the editor and the renderer. ●

Q&A

Our experts this month...

3DS MAX

Pete Draper is the VFX Director at Lightworx, Bristol. He finds that rallying in a Laguna ain't what it's cracked up to be... www.xenomorphix.co.uk

BLENDER

Bassam Kurdali is a character animator and 3D addict who sometimes doubles as an electrical engineer www.slikdigit.com

CHARACTER STUDIO

Chris Ollis is an animator and character artist at Codemasters, a regular contributor to *3D World* and a hardcore GameCube addict www.intertwined.co.uk

EIAS

Lance Evans is author of *Professional 3D with Electric Image Universe*. His clients include Miller Beer and Absolut Vodka www.3dny.com

LIGHTWAVE

Benjamin Smith is director of digital film production service Red Star Studio. He's thirsty, but the vending machine scares him... www.redstarstudio.co.uk

MAYA

Gary Noden works at 422 Manchester, who seem to have shrunken his chair while he was away over Christmas, eating lots of pies www.422manchester.com

SIL0

Glen Southern is a UK-based freelance artist and sculptor, specialising in *LightWave* and 3D modelling packages www.southerngfx.co.uk

SOFTIMAGE|XSI

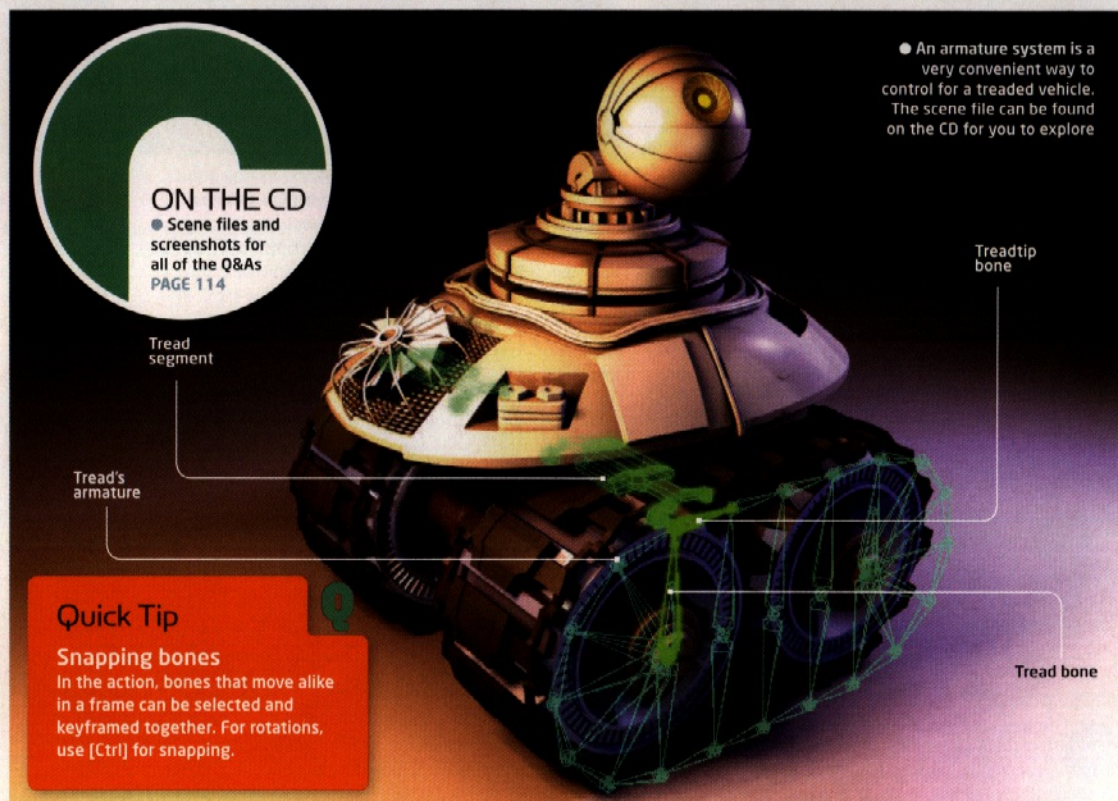
Ola Madsen works as a 3D artist in Sweden, animating everything from medical treatments to cute furry teddy bears www.digitalcontext.se

VUE 5 ESPRIT

Eran Dinur is a 3D artist, musician and animator. He's created sample scenes for *Vue 3*, *Vue 4*, *Vue Pro* and *Vue 5 Esprit* www.e-onsoftware.com

Quick Questions

No matter which 3D software package you use, our team of experts is here to help you out. Send us your technical query, and we'll provide a simple, concise solution



Quick Tip

Snapping bones

In the action, bones that move alike in a frame can be selected and keyframed together. For rotations, use [Ctrl] for snapping.

BLENDER | Repeating actions on a path with stride length

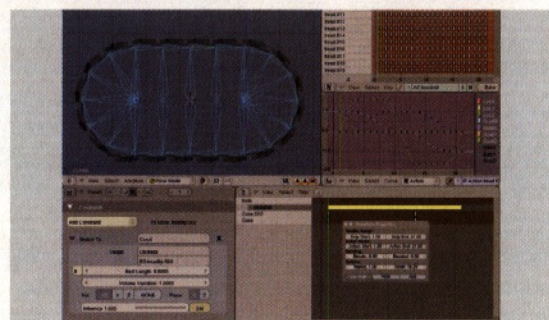
Q I'm currently animating a tank. How do I create realistic caterpillar tracks? **ROALD SINISSAAR, VIA THE FORUMS**

A This follows on nicely from our lead Q&A on page 76, on creating a believable tracked vehicle. Model the tracks from individual mesh segments; model one, then make linked copies ([Alt] + [D]), positioned and rotated around the shape of the track. For example, 20 segments = two groups of six segments to wrap around the front and back wheels in semicircles, and two straight-line groups stretching between the wheels. You can always tweak the mesh in Edit mode to make sure the segments connect.

To control the track, make an armature in the same shape. Build it out of L-shaped parent-child bone pairs, arranged as in the image pictured right. The long side of the L shape is the parent. In Pose mode, constrain each treadtip bone to the next with a Stretch-to Constraint, until the last one has a constraint attached to the first.

Now, parent each mesh segment to the armature, specifically to the treadtip bone closest to it. Create a new action. Keyframe the default location and rotation of all the bones named tread (tread.001, tread.002 and so on), then advance the frame by one and move each tread bone into the position/rotation of the next in the direction of rolling. Advance the frame counter, and repeat until you have a 21-keyframe action with an identical first and last frame. Select all channels in the Action Editor, and go to Key > Interpolation Mode > Linear.

To animate, convert the action to an NLA strip ([Ctrl] + [C] in the NLA window), then hit [N] for transform properties. Activate the Use-Path button and, in the stride length numbutton, enter the length of the circumference of the track (it can be an estimate - 20 times the length of an individual segment in *Blender* units). Parent the armature to a path, apply the Follow-path constraint to it using curve-follow, and the caterpillar tracks will roll along the path. This is also the standard procedure for a walk cycle. **[BK]**

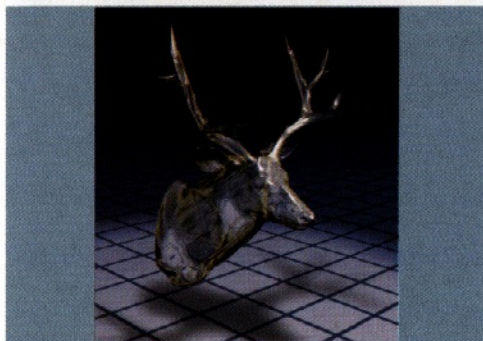


● Setting up the armature/action is repetitive. Be sure to name objects before duplicating to help organise and keep track of the process

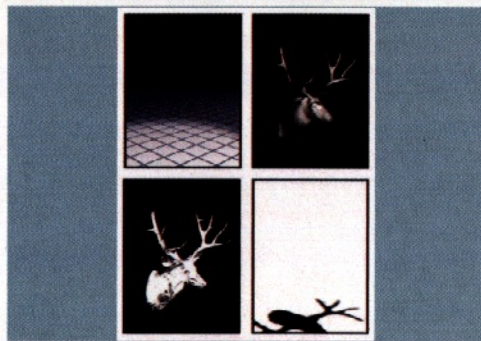


EIAS | How can I create refractions without raytracing?

TAYLOR SCHOEN, VIA EMAIL



01 Get better results with Phong rendering
Glass refractions can be realistically simulated using Phong rendering. The benefits include much faster rendering than raytracing, the ability to create and adjust them on the fly in post, and they often even look better than the real thing - as you can see here. The technique involves a bit of multi-pass rendering by creating an Edge Roll-Off pass, in addition to Glass, Background and Shadow passes. All passes often take less time than a raytraced solution.



02 Extract the model's shape
To produce the Displacement pass, we want to somehow pull out the essential shape of our model. First, set your model to white, and turn its Diffuse Falloff way up - about 3.0 was used for this image. Next, add a Camera Light to the scene; these are automatically placed on the camera like a miner's hat with a flashlight. All other lights, including World Ambient, are turned off.



03 Use a Displacement filter
In *After Effects*, apply the Displacement filter to the Background layer, with our Edge Roll-Off pass image as its source, and set to Lightness. Adjust the Horizontal and Vertical values to suit your taste. The Glass and Shadow layers are dropped on top to snap the image together. You can see an animated version of this project on the CD, along with all the project files. [LE]

LIGHTWAVE | HyperVoxel particles

Q How can I cover a soda can in droplets of water?
MARKR, FROM THE FORUMS

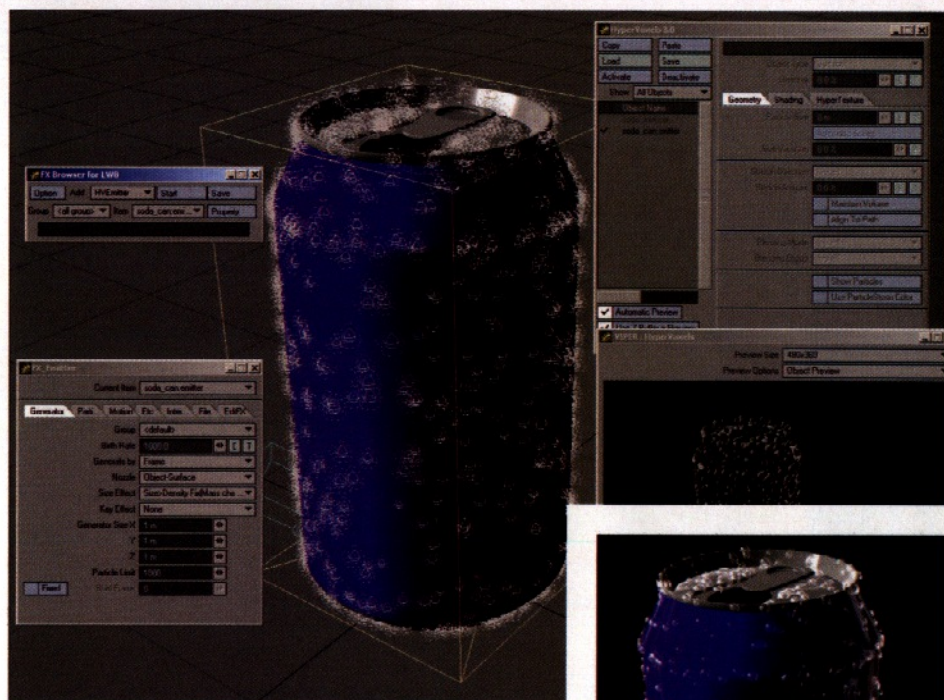
A This is a really common question: how to create that picture-perfect image of a soda can covered in tiny beads of moisture, which you see all the time on vending machines and the like. All those drops of water make it look ever so desirable to the thirsty man who obediently thumbs coins into the slot of the machine, to be greeted a few moments later by a loud thud, celebrating the arrival of a can of drink - strangely devoid of such droplets.

While some vending machines may lead you to an early grave, in *LightWave* it's a doddle to get this moisture effect. Load up the soda_can object (Included on this issue's CD) and, in the Scene Editor, deactivate the soda_can.emitter layer so it won't render. Invoke the FX_Browser from the Setup tab and, with the soda_can.emitter selected, go to Add > Apply FX_Emitter to turn this object into a particle emitter, then hit the Properties button to bring up the Particle Options. The Nozzle should already be

IN LIGHTWAVE, IT'S A DODDLE TO GET THIS MOISTURE EFFECT

set to Object-Surface, so set Birth Rate to 1000 and Generate by to Frame. This should force the object to bloom 1000 particles over its surface in the first frame.

Bring up the HyperVoxels panel and activate soda_can.emitter. If you then invoke VIPER you'll see that the default surface mode HyperVoxels have already given you a coating of droplets over the can (currently invisible - render a frame so the rendered can is buffered into the VIPER preview). Fiddle with the Particle Size and add a Size Variation to randomise them a bit, and then all that remains is to surface them to look like water droplets. The HyperVoxel's Shading panel is a clone of the normal surfacing options, so - exactly as you would for normal geometry - make them 100% transparent, highly specular and very reflective, using a reflection map if you don't have a suitable environment set up in the scene. [BS]



Quick Tip

Control your emissions
We applied the FX_Emitter to a separate, trimmed-down soda can model to prevent *LightWave* from emitting too many points around dense-detail areas (near the ring-pull) and too little around the sides.



● Using the surface of the can as a Particle Emitter means you can sprinkle it with particles which, rendered with HyperVoxels, easily covers it with droplets of water. You can control the density and appearance with the Particle Settings



VUE 5 ESPRIT | Using radiosity for interior lighting

Q I'm working on an interior scene at the moment, in which daylight comes in through windows. I'm trying to use the radiosity model, but the result I'm getting is just rather dark and patchy. How can I achieve bright, smooth lighting? **SAKIC, VIA THE FORUMS**

A Vue's new global lighting and radiosity engine is designed primarily for outdoor rendering, but it can produce very good interior lighting solutions – provided you set the correct parameters. In the sample scene (pictured right), the room is completely closed, and the only source of light is the sun shining through the window. The global lighting model won't do the job properly here, because only a small part of the room is exposed to exterior light. You must, therefore, use the radiosity solution in order to fill the room with light bouncing off the surfaces.

First, set up your atmosphere and sun position, and then switch to the radiosity model. If you test-render your scene now, the room will probably look too dark. The limited amount of sunlight coming through the window simply doesn't have enough 'energy' to bounce around and fill the room – you need to boost some parameters.

Take a look at the light panel screenshot on the bottom right of this Q&A. The Light Balance is set at around 50% to get enough ambient light presence, without losing the direct sunlight effect. To add a bit of sunlight overexposure, turn up the Light Intensity. Raise the Sky Dome Gain to 2, then make its colour whiter to add more power to the ambient light.

Finally, to brighten the overall radiosity solution, you need to change Radiosity Bias from black to medium grey. You could raise the Radiosity Gain instead, but this might lead to an exaggerated 'colour bleed' effect – the best way to see the difference is to experiment with the settings.

To achieve a really smooth effect, you need to raise the Quality Boost slider. Be careful when you go about this, though – upping the value will increase render times considerably (note that a value of 0.5–1.5 is usually enough). For optimum results, you should also use a higher render setting, such as the Final or Broadcast modes. **[ED]**

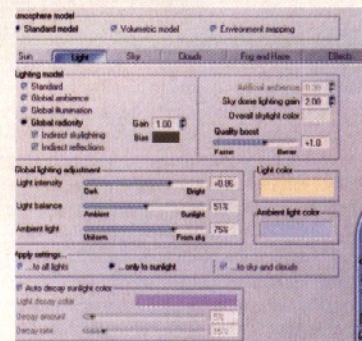


● Vue's new radiosity model accurately calculates the effect of exterior light entering a room through the window and bouncing off the surfaces

Quick Tip

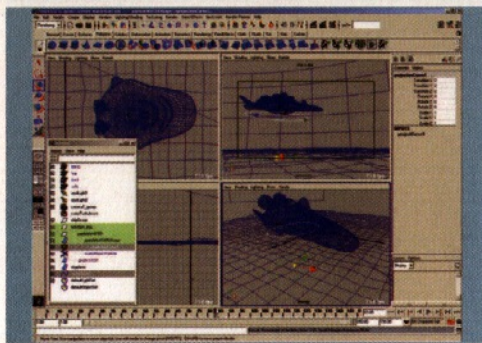
Lower the ambience
When using high levels of ambience, objects outside the room (like the tree) might appear overexposed. Reduce their material's ambient level in the Effects tab to fix this.

● To increase the power and brightness of the radiosity solution, you need to tweak some parameters in the Atmosphere Editor's Light tab (see main text)

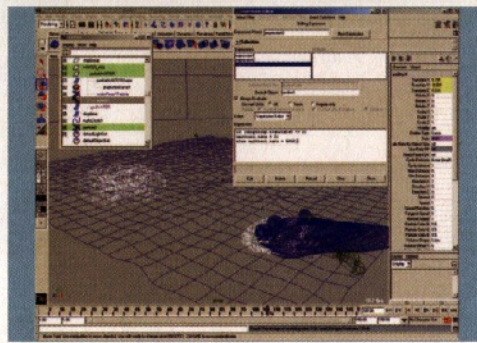


MAYA | How can I simulate an object splash-landing in water?

IEST_ROB, VIA THE FORUMS



01 Open the scene file on the CD. Open shipStart.mb and play the splashdown animation. Create a nurbsCircle. Scale it up to 2.5, 2.4 and TranslateY it to 5. Select this and the particleWater object in the top camera. Select Edit NURBS > Project Curve On Surface. Create this expression, locking the projecting curve to the X and Y position of the spaceship: "nurbsCircle1.tx = shipGroup.tx; nurbsCircle1.ty = shipGroup.ty;"



02 Emit particles from the object. Select your projected curve and select Particles > Emit from Object > Option box. Set the Type to Curve. Click Create. With the Emitter selected, select Rate and right-click to get the Options list. Click Expressions. In the Expression Editor, type: "if (shipGroup.translateY >= 2) emitter1.rate = 0; else emitter1.rate = 8000;" – i.e. if the ship is at or below the water level, emit particles; otherwise, don't.

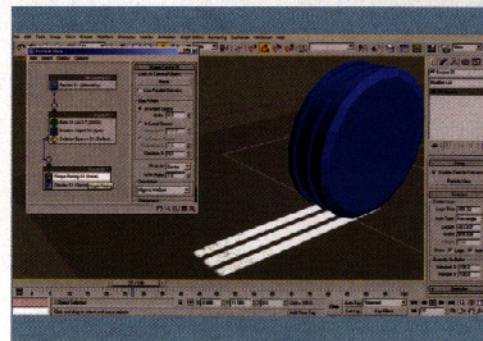
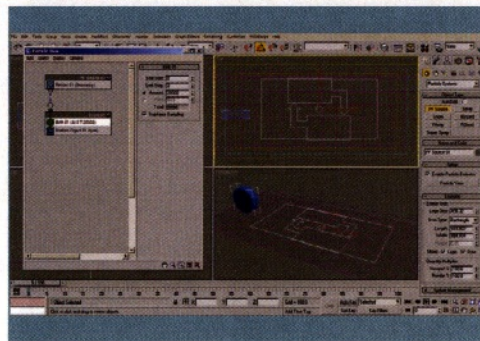
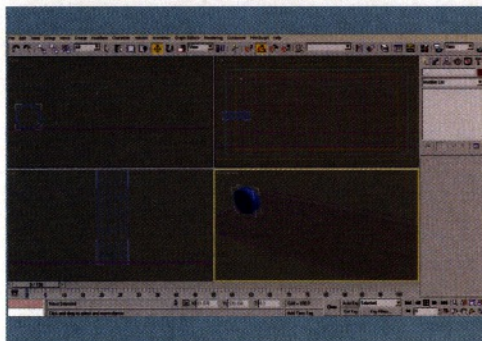


03 Make adjustments, then render. Select particleShape1, create Fields > gravity, and set Magnitude to 12. Change particleShape1 to a Multistreak, Multicount to 60, Multiradius to 1.45, and Tail Size to 2. Adjust the emitter's speed controls. Add colour and opacity values to the particles. Render in the Maya hardware renderer using the Geometry Mask setting, then composite onto your beauty pass in an app like Digital Fusion. **[GN]**



3DS MAX | How can I create the tracks that vehicles leave in mud?

JIM MALLARD, VIA EMAIL



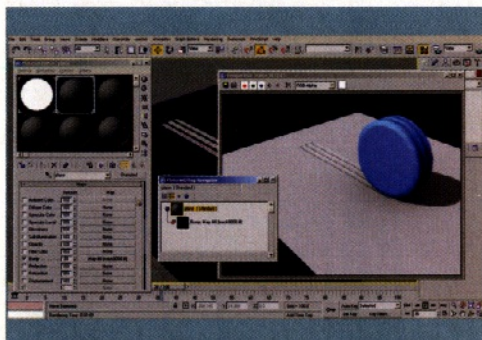
01 Open up the start scene file
Open up the `mud_tracks_start.max` file from this issue's CD. To generate the tracks in the mud, we're going to use a Particle System to place particles on the surface where the wheel intersects with the ground. These particles will be rendered off to generate an animation, which will be re-loaded back into 3ds max to displace the plane.

02 Make particles that stick to the tyre and reproduce
Create a Particle Flow system in the Top Viewport. Open Particle Flow and remove the Display, Speed, Shape and Rotation operators. Replace the Position Icon operator with a Position Object operator and add the Tyre object. Enable Lock On Emitter and set Location to Selected Faces. Set Birth Amount to 20,000 and Emit Stop to 0.

03 Wire up to a Collision Spawn test
Add a Collision Spawn test to the event, and add the scene's provided Deflector. Set the Inherited Speed to 0 to make the particles static, enable Spawn On Each Collision and set the amount to 100. Create a new event with a Shape Facing operator. Wire the new event to the output of the Collision Spawn test, and set the Size to 4 to fill in gaps.



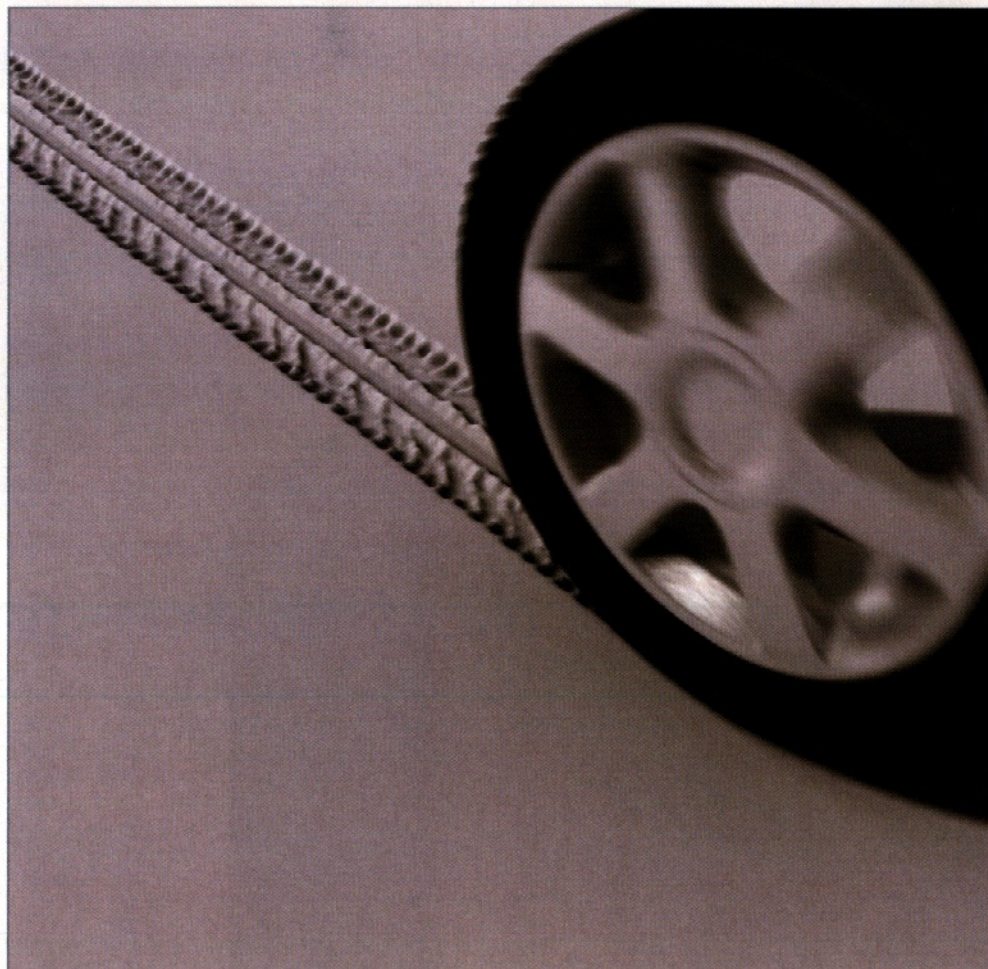
04 Render off the animation
Next, assign a self-illuminated white material to the event by adding a Material Static operator and instantiating the material to the operator's material slot. Size up the plane to the safe frame in the Top Viewport, then hide the plane and the tyre. Now render off the animation with the dimensions of the plane so that the resulting map fits perfectly when it is reassigned.



05 Load the animation back into max
Once the animation has rendered, load the animation back into 3ds max as a Bitmap map in the Bump slot within the Plane material. Set the Blur Offset to 0.001 to remove any artefacts that may occur when the Bump map is rendered, and set the Bump amount to -30 so that the white rendered particles depress the surface.

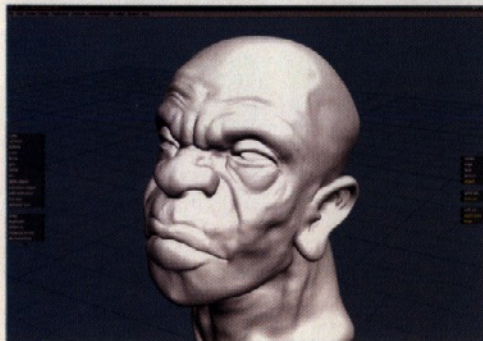
06 Sit back and view your good impressions
We can finally turn off the Particle System. Unhide the Tyre object and render off the animation. Although this is a material shading effect to give the impression of texture, the result is convincing for a shallow depression. Putting all this knowledge onto a higher-detailed wheel, we can get some cool effects. This method is good for

creating slight indentations that have the depth of the tread, but for deeper treads you'd have to mix the resulting Track Animated map with additional maps to control displacement, or you'd just get a very high displacement of a tread imprint, and not the trench dug out by the tyre. If you want a greater impression in the ground, try using Material displacement or a Displace modifier to physically depress the surface. [PD]

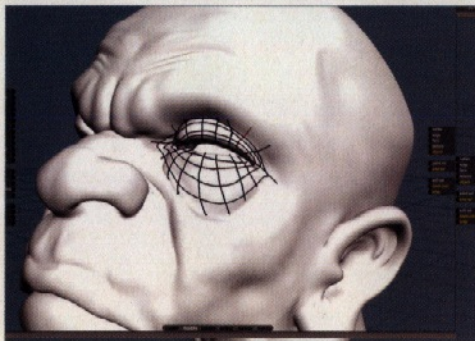


SILO | What is the Topology brush and what can I use it for?

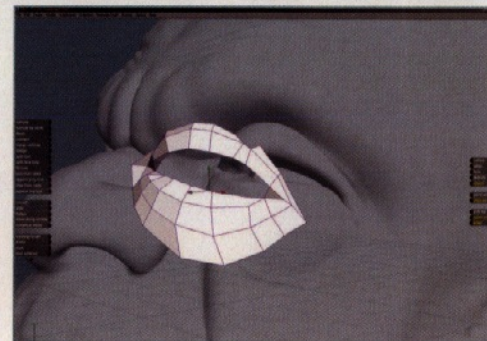
ZOE LUCOCK, VIA EMAIL



01 Get your model ready
The Topology brush in *Silo* enables you to draw new topology on top of a high-resolution model (from scan data or *ZBrush*). With it you can generate clean meshes that have very accurate topology and edge loops. To get started, load up your reference model. Go to Display > Object Display Mode > Smooth Shade. Rotate the model until the part you wish to work on is facing you, then deselect it.



02 Draw with the Topology brush
Go to Modify > Topology brush from the drop-down menu (or use the side panels if you have them). Now start drawing the topology that you require onto the high-resolution mesh. You can freely rotate the model as you work, allowing you to access any areas that may be hidden. Build up edge loops into rings, then dissect them with lines in exactly the right place for your new model.



03 Produce an editable new model
In effect, you are drawing your new edges onto the surface of the detailed model. When you have completed the area, hit the Enter button. This generates a new model from your lines. If you select this new patch you can manipulate it in the usual ways, modifying the polygon faces, edges and vertices to further refine it. [GS]

CHARACTER STUDIO | Advanced skinning techniques

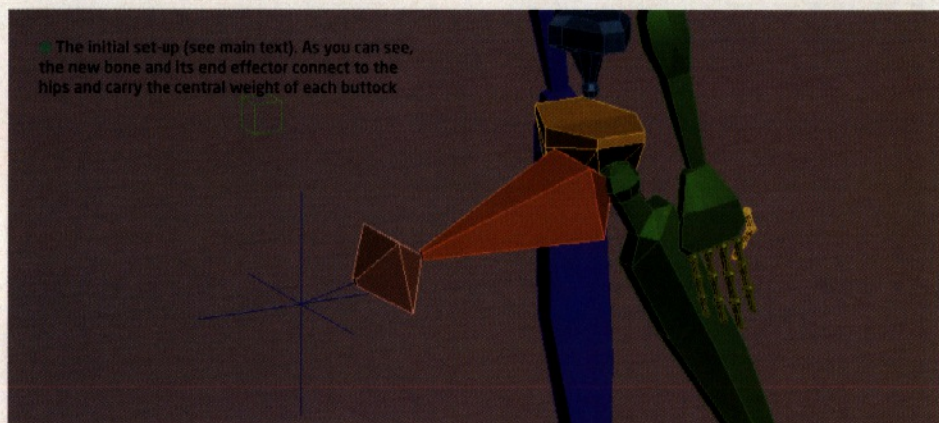
Q Please help me sort out the skinning for the rear of my figure! Everything else has skinned absolutely fine, but when the figure moves to an extreme, the buttock area moves incorrectly - this looks awful. Is there a more efficient way to skin this than the usual hip and leg bones? **JON DRAPER, VIA THE FORUMS**

A The standard hip and thigh bone set-up is fine for most character rigs, but occasionally a character will require an extreme movement (high kicks, the splits, and so on) that drags the vertices too far and causes unsatisfactory results, with either an unbalanced distribution of geometry or stretched textures. The simplest solution is to add new bones that link to (and run backwards from) the hip bone, out through the middle of each buttock (see the main image, pictured right). This will provide a central point for the vertex weighting to work around, and will also offer a further level of control for where the main mass of the Gluteus Maximus sits.

THE SOLUTION IS TO ADD NEW BONES THAT LINK TO THE HIP BONE

The downside is that you now have two extra bones to animate throughout. This is too much like hard work, so try the following solution: create the buttock bone and its end effector. Now create two Dummy objects, one above the buttock bone which is linked to the hip and one below, linked to the thigh (see the inset image). Re-select the buttock bone, then, from the Animation menu, select IK Solvers > HI Solver and drag the cursor to the bone's end effector. Now select the new IK Goal (the cross) and, from the Animation menu, select Constraints > Position Constraint and drag the cursor to the top Dummy object. The IK Goal (and the end effector) should snap to the middle of the dummy. Now repeat the process, this time constraining to the bottom Dummy object so that the position constraint is shared between the two dummies.

And that's it. Rotate the thigh bone, and you should now see that the buttock bone maintains a central position. [CO]



● The final automated set-up. The Dummy objects share control of the buttock bone, thus maintaining a central position and a naturally positioned cheek



SOFTIMAGE|XSI | Rigging inanimate objects for animation

Q What's the best way to animate a box unfolding in Softimage|XSI? **CAROLYN WATSON, VIA EMAIL**

A The most powerful way to set up the animation is by using bones. For the modelling, I'd recommend starting out with a simple cube, extruding the sides to match your reference box in its unwrapped state. As each side and flap of the box is separate, the placement of the bones should be obvious - but if you do get stuck, see the screenshot on the CD.

To control each flap, use a one-bone chain with the start and end points aligned appropriately. You can either envelope each side to a single bone in the same way, or use two separate two-bone chains to control all the sides. Once all of your bones are in place (there should be 13), make each flap a child of the corresponding side bone. Depending on the type of material your virtual box is made of (and your desired style for the animation), you might want to use two-bone chains for the sides of the box and the flaps. While a single bone is sufficient to control the folding, the extra bone will enable you to create a softer deformation, avoiding the otherwise slightly stiff look.

While the folding and unfolding of the box is neatly attained with the bones, they won't be very practical on their own if you

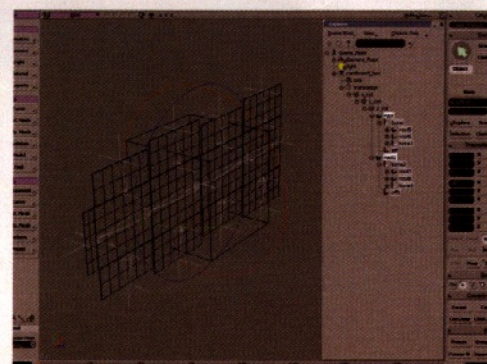
WE COULD EASILY RUN INTO A PROBLEM CALLED GIMBAL LOCK

want to translate or rotate the entire box. To ensure any potential transforms function properly, you'll need to extend the parent and child relationships a bit further. If you were to create a single parent for the entire bone structure, and use this for all the transforms, you could easily run into a problem called Gimbal Lock - in animation, rotation on two or more axes of an object can create unpredictable results. By extending the depth of the hierarchy with four more objects, one for the overall translation and one for each rotational axis, you not only avoid this potential setback, also add a great deal of flexibility to the set-up. To see this in action, explore the scene file on the CD. **[OM]**



Quick Tip

Achieve a cartoon style
Adding a Budge or Lattice deformer to the box geometry can create some nice cartoonish poses on the box



Using hierarchies where different objects control the X, Y and Z rotation of the box - as well as the translation - adds greatly to the degree of control you have over your final animation

CONUNDRUM | Send us your solutions to this month's brainteaser

Each month, we set you, the readers, a real-world 3D problem to solve. The sender of the best solution will win selected training resources. Our first conundrum was suggested by 3D World reader David Martin, who wrote:

"How can I animate a scene similar to the one in 2001: A Space Odyssey, in which a stewardess walks up the inside wall of a spaceship. She travels a complete 180-degree arc, and ends up 'upside down' I'm using Character Studio."

The answers submitted ranged from the sublime to the ridiculous - most notably, musashidan's suggestion that the simplest solution would be to persuade Lionel Richie to reprise his '80s hit *Dancing on the Ceiling* inside a "rather large sewage pipe", then video and rotoscope the resulting footage.

However, as Jon-Stew was the first person to point out, the simplest solution is to do what Stanley Kubrick did on the original movie: build a circular set, parent the camera to it, then rotate the set. Although the stewardess can then be animated walking normally on a horizontal path, in the resulting footage, she will seem to be walking around the wall. Fellow forum user Peter S supplied a more detailed solution based on the same principles: "Create a background scene and animate it with a moving camera if required. Render this out, then delete the background but keep

the camera. Add your cylindrical set and foreground character. Add a plane behind the set. Animate the walking character and rotate the set to match. Now parent the camera and plane to the set. Project the background animation onto the plane. Now, when the set rotates, the camera and background will move with it, so the set will appear still and the character will appear to rotate. The background animation will also match the scene, even with a moving camera."

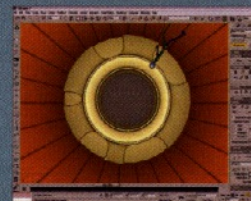
Congratulations to both Jon-Stew and Peter S: books and training DVDs are now in the post on their way to both of you

THIS MONTH'S QUESTION

Our conundrum for issue 63 is submitted by Maya forum user fahiem, who writes:

"I've created a virtual city and I want to walk around it, looking directly out of the camera view. How can I make the camera react to the keyboard: i.e. to move forward, I press forward?"

You can post your suggestions on the appropriate threads in either the Mag Related or software-specific sections of our forum, or email them to us at the address at the side of this page. Again, over to you, and good luck...



You could resort to technical tricks, but to make a character studio character walk up the wall, the simplest solution is just to build a circular set, and rotate it...



Training resources on offer!

Post your solutions to the conundrum on our forum, and the one we think is best will earn its author selected 3D training resources...

Forum | Post your answers at <http://forum.3dworldmag.com>



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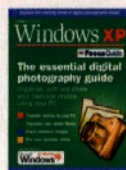
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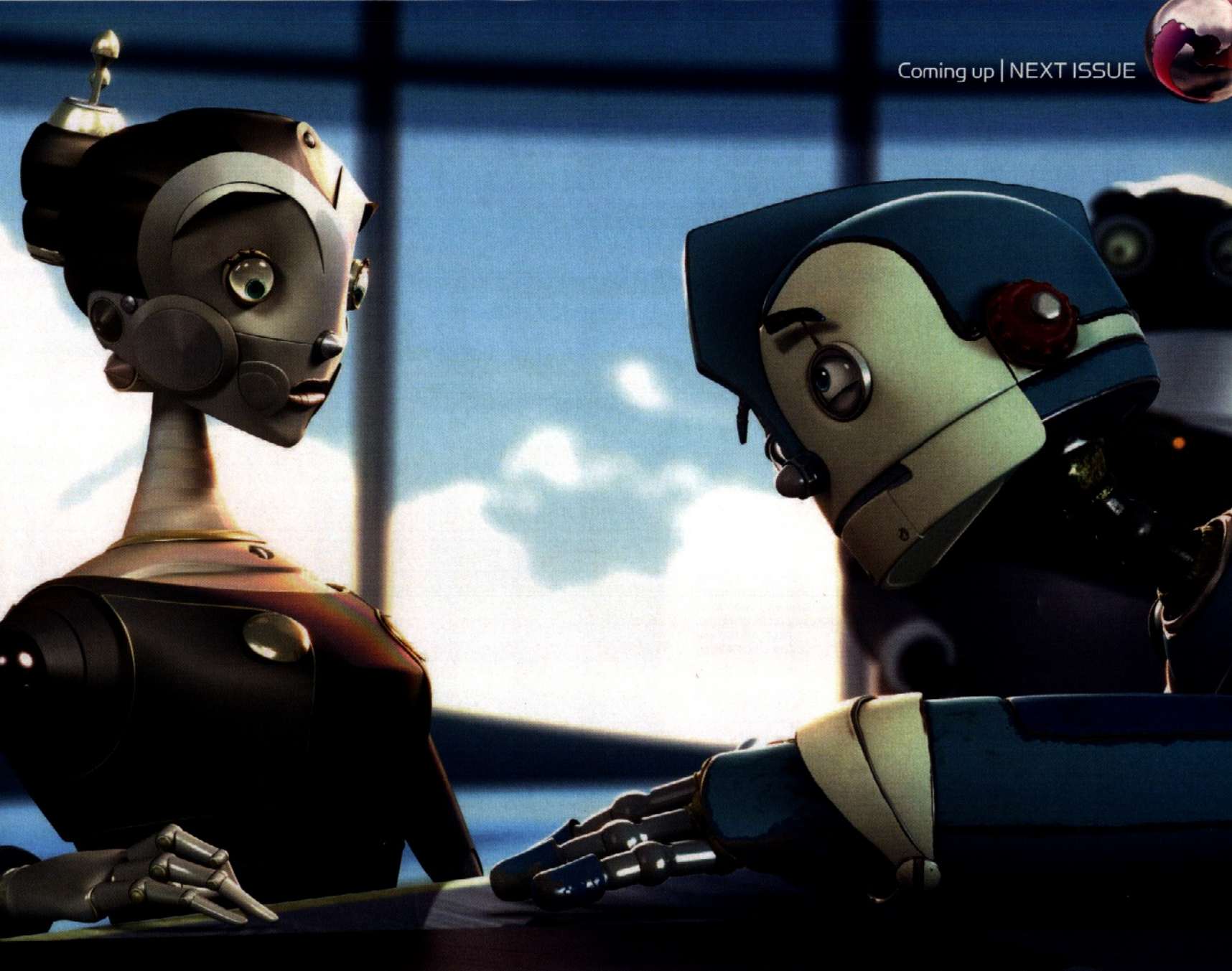
CONTENTS SUBJECT TO CHANGE

From the makers of

Microsoft The Official Magazine
Windows XP



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IN ISSUE #64



● After three years in hibernation, Blue Sky Studios is back with a new 3D feature, *Robots*

ROBOTS!

Ice Age creators Chris Wedge and Blue Sky Studios are back with *Robots*, their mechanical masterwork

SKIN!

3D artist Leigh van der Byl presents an in-depth guide to texturing and shading perfect photorealistic skin

SLAVERY!

An in-depth report on working conditions across all 3D industry sectors - are you *really* being treated fairly?

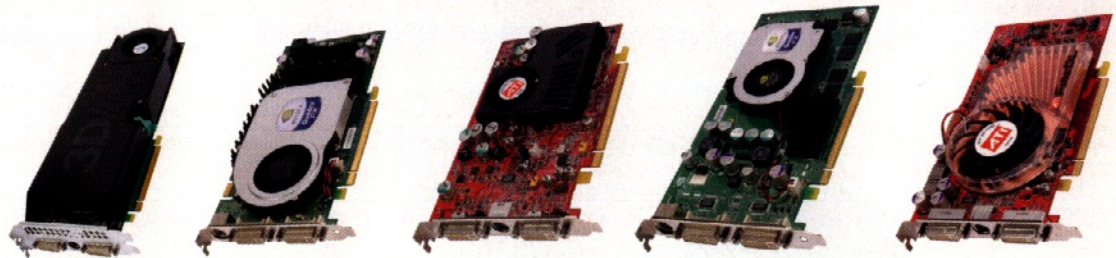
ON SALE TUESDAY 29 MARCH

REVIEWS

HARDWARE / SOFTWARE / BUYERS' GUIDE

● On test this issue
(clockwise from right):
Quadro FX 1300, FireGL
V5100, Wildcat Realizm 800,
FireGL V3200 and
the Quadro FX 3400





PCI-E cards

GROUP TEST A powerful graphics card can make a big difference to your working environment, but which one offers the best value for money? **BY MAT BROOMFIELD**

The law of diminishing returns states that, in a given situation, the cost for improvement isn't linear - it's exponential. In other words, you pay more and more (or you work harder and harder) for a smaller and smaller improvement. The graphics card market is a great case in point. For £300, you can get a competent card. For twice as much, you get a 50 per cent improvement in performance, yet for five times the cost, you still don't get double the performance.

However, it's a question of cost versus time. When you're paying a designer £300 a day for his time, a 30 per cent improvement in productivity means that you get an extra £90 more work out of him at the end of the day. Within a month, you've saved enough to buy the most expensive card in this round-up, and the productivity gains will keep on stacking up.

So is it all just about the money now? Has buying a new 3D accelerator come down to simple economics? Well, we're happy to say that, for the average user, the answer is yes. Why does that make us happy? Because it means that all the issues that used to be major selling points - such as antialiasing, texture filtering, multiple outputs, support for advanced shaders, full compliance with OpenGL and DirectX, certified drivers and

stability - are now a given standard. You no longer have to worry whether or not the average card can produce the quality, or has the compatibility that you require. The simple question is: how many polygons do you need to move around the screen in real-time, and how much are you prepared to pay for it?

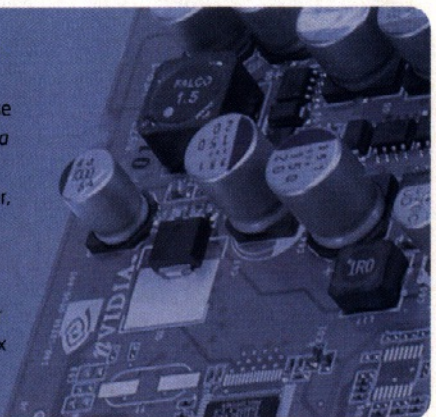
Perhaps one of the last major defining factors - and this can have a huge impact on the its performance too - is a card's drivers. On a simple level, these merely define how well the card responds to display instructions issued to it via the DirectX or OpenGL APIs. You only have to look at the Realizm's abysmal DirectX performance (compared to its group-leading OpenGL capabilities) to see the importance of optimised drivers. Furthermore, these can be custom written to enhance specific applications. For instance, Nvidia must be very concerned to see that there's optimised support for ATI's cards integrated directly into *3ds max* now, because this theoretically yields significant performance benefits.

If you're a games designer, you might not think this applies to you. However, there are still distinguishing choices to make between manufacturers, but they're not as black and white as you might expect. So, whatever your requirements for your graphics card, read on while we reveal the shades of grey...

TALKING POINT | What sort is best for you?

BEYOND THE SUPERFICIAL level of how many polygons a card can render, it's difficult to differentiate between cards. The two questions you need to ask are: which software packages will I use? And does the card provide enhanced drivers for them? If you're using a range of apps, with mixed support, opt for the card that offers the greatest raw polygon-pushing

power. However, if you primarily use a single package such as *max*, *Maya* or *AutoCAD*, some manufacturers produce optimised drivers. However, these didn't generate appreciable speed improvements; rather the benefits could be seen in terms of enhanced shader quality, for better real-time representation of complex textural effects and lighting.



DETAILS

PRICE
£1,500 / \$2,797* / €2,174*

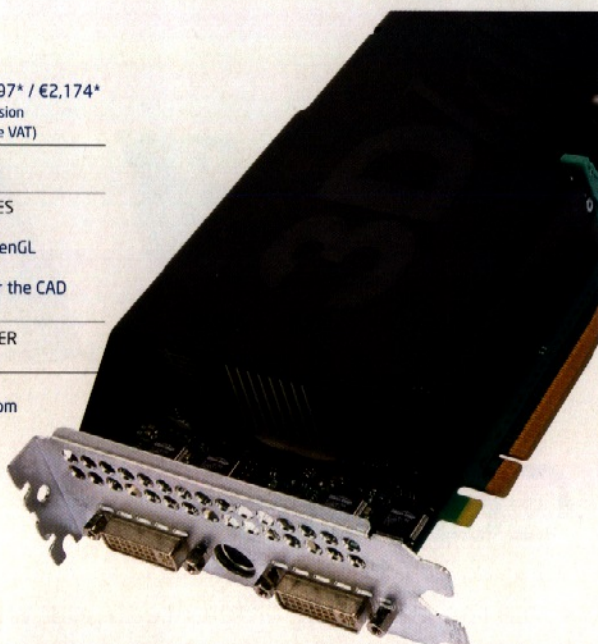
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC

MAIN FEATURES
• 640MB RAM
• Blistering OpenGL performance
• Optimised for the CAD market

MANUFACTURER
3Dlabs

WEBSITE
www.3dlabs.com



Wildcat Realizm 800

3Dlabs has been out of the game for a few years, but with the Realizm, the company is back with a bang



You can get into a fruitless numbers game with computer hardware, analysing Megahertz, Gigabytes, pipelines and processing units. Manufacturers would have us believe that more is better - not true. 3Dlabs' claim of "two VPUs - twice the processing power!" is meaningless: It's what the VPUs can do that makes them special, not how many there are.

The Realizm 800 is fast, it can handle massive datasets, and has lots of memory. But, whereas ATI and Nvidia have a unified memory architecture that allocates memory for different purposes, this card has discreet memory areas for geometry, textures and so on. This can have a detrimental effect if your scenes have a bias towards a particular area because you can have most of your RAM free, but still have insufficient memory for the task at hand. To overcome this, the Realizm can also utilise your hard drives to provide up to 256GB of virtual memory.

The Realizm 800 scores the highest on our OpenGL benchmarks, showing its efficiency in a real-time animation environment. More practically, this makes it a fantastic tool for professional CAD

development, especially at high resolution or with large datasets. However, it scored worse in the DirectX benchmark than the cheapest card here, so it's a poor platform on which to develop games. Admittedly, 3Dlabs claims results more than twice as fast as our results, when equipped with its as-yet-unreleased latest drivers. But even then, its best score puts the Realizm 800 way behind the competition.

The Realizm is a real processing beast, with massive power at a hefty, but not unreasonable, price. It's a great CAD and visualisation development platform and, provided you edit in an OpenGL environment, it'll keep things running smoothly, no matter how high the polygon count gets.

VERDICT

PROS

- Excellent image clarity
- Great OpenGL performance
- Huge memory

CONS

- Abysmal DirectX support
- Physically too large

| | |
|-------------------|---|
| RANGE OF FEATURES | 6 |
| VALUE FOR MONEY | 7 |
| OVERALL | 7 |

DETAILS

PRICE
£893 / \$1,661* / €1,299*

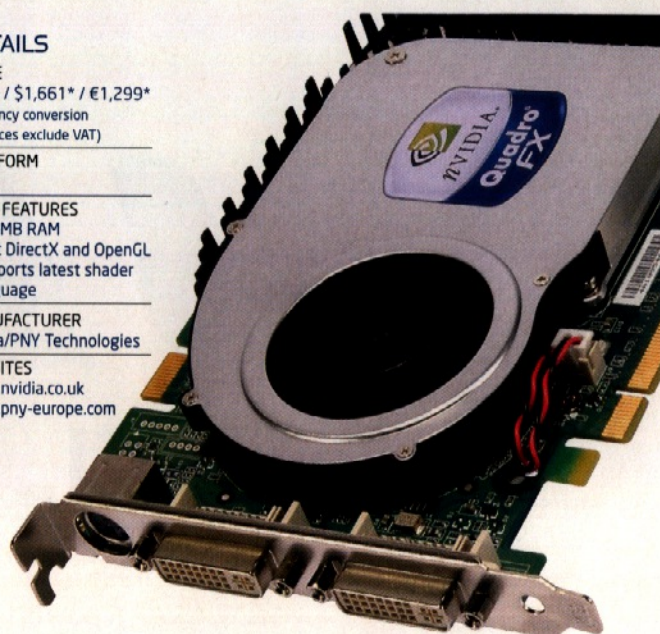
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC

MAIN FEATURES
• 256MB RAM
• Fast DirectX and OpenGL
• Supports latest shader language

MANUFACTURER
Nvidia/PNY Technologies

WEBSITES
www.nvidia.co.uk
www.pny-europe.com



Quadro FX 3400

Image quality versus performance - a tough call, but one that you'll need to consider if you buy the 3400



The 3400 was the most powerful card that Nvidia could supply us with and, initially, it's slightly outperformed by ATI's cheaper V7100 (not reviewed here) and 3Dlabs' costlier card. Nvidia said its newer beta drivers provided better performance, so we used those instead; the benchmarks jumped by 50 per cent. But, given that level of improvement, why is the card being sent out with inferior drivers? And why are even the best performing drivers configured with far from optimal settings?

Nvidia was the first company to introduce programmable shaders, making these far easier to incorporate in apps such as Maya with its Cg scripting language. However, the language was still difficult to write for, and has now been made obsolete by Microsoft's own HLSL, which is fully supported by the 3400. In fact, the Quadro family is the only range of cards to support HLSL 3 - although Nvidia was unable to provide us with any samples to show how the implementation of this standard makes a difference. Maybe it's an example of the technology preceding software support for it...

It's ironic that while this card supports DirectX 9 and offers excellent 3DMark performance, it only supports OpenGL 1.5, rather than the more extensible 2.0 version. In fairness, this version has been a long time coming, so perhaps Nvidia felt that support for existing platforms was more important than support for incomplete and unimplemented professional APIs. But then why HLSL 3?

In any case, this bias tends to favour the card as a games development platform, rather than an all-round solution, making it diametrically opposed to the Realizm. However, it does also come with custom drivers, optimised for 3ds max and AutoCAD, which can yield a performance boost in excess of 10 per cent.

VERDICT

PROS

- Good all-round performance
- Support for HLSL 3
- Fast memory

CONS

- Expensive
- No OpenGL 2 support

| | |
|-------------------|---|
| RANGE OF FEATURES | 8 |
| VALUE FOR MONEY | 5 |
| OVERALL | 7 |



DETAILS

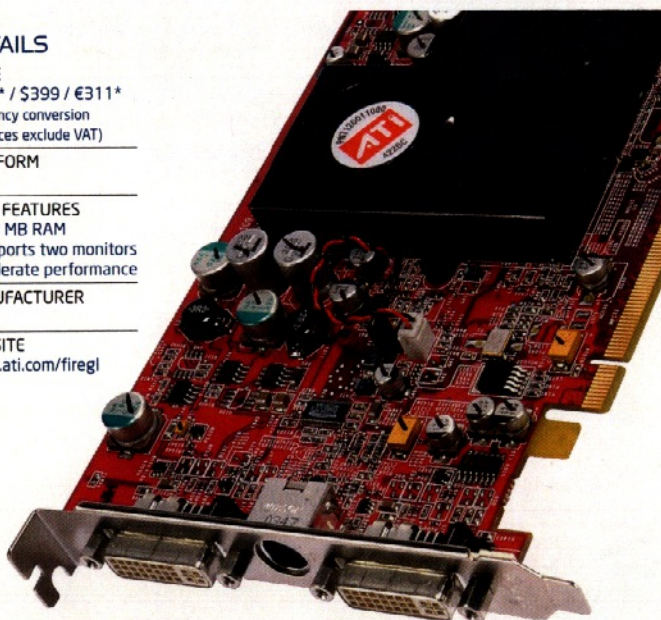
PRICE
£215* / \$399 / €311*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC

MAIN FEATURES
• 128 MB RAM
• Supports two monitors
• Moderate performance

MANUFACTURER
ATI

WEBSITE
www.ati.com/firegl



FireGL V3200

It's the cheapest card in the group, but what does that really mean in terms of performance?

FireGL is a brand that has undergone many changes of ownership over the years. It has always been one that provides good workstation performance, but in spite of that, some models over the past five years have been less worthy than others and there's always the danger of diluting the brand identity.

This card has been designed to compete with Nvidia's entry-level models, and at just £220, it's inexpensive enough. In fact, it's cheaper than many games cards. And when you compare its DirectX performance to that of the Quadro FX 1300 (which costs twice as much) the V3200 offers double the power, and almost five times the power of the Realizm. According to ATI, this is a crucial attribute because DirectX will become more important as Microsoft throws ever more weight behind it. Other vendors have conflicting opinions, but one thing is for sure – right now, DirectX gives you immediate support for shaders, which in turn provides a higher degree of realism within applications that support them.

The card's OpenGL numbers are far more in line with our expectations, coming

second lowest, but it's ahead of the 1300 again. ATI has also been price-cutting very aggressively, presumably in an effort to reposition its cards and erode Nvidia's market dominance. If this is an example of the kind of value we can expect in the future, then it would seem that it's to our advantage, provided of course that ATI doesn't start cutting corners on driver certification and testing.

So, in terms of usability, how did this budget card fare? Well, we worked in 3ds max using a variety of the included sample scenes, and everything stayed lively. However, we found that as soon as the polygon count started to rise, or you switch on full real-time shader mode, the card shows its limitations.

VERDICT

PROS

- Balanced
- Optimised 3ds max support
- Requires no additional power

CONS

- Limited power & memory
- No HLSL 3 support

| | |
|-------------------|---|
| RANGE OF FEATURES | 7 |
| VALUE FOR MONEY | 8 |
| OVERALL | 7 |

DETAILS

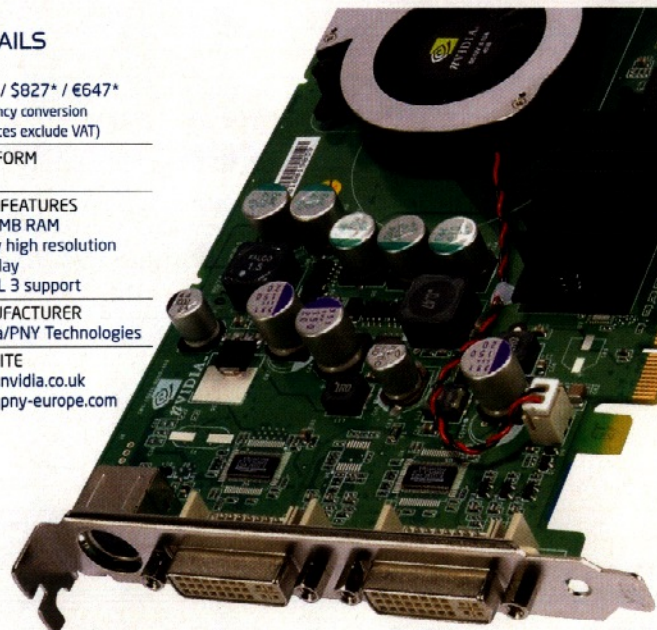
PRICE
£445 / \$827* / €647*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC

MAIN FEATURES
• 128MB RAM
• Very high resolution display
• HLSL 3 support

MANUFACTURER
Nvidia/PNY Technologies

WEBSITE
www.nvidia.co.uk
www.pny-europe.com



Quadro FX 1300

£500 means that this is no bargain-bucket card, but its performance leaves a little to be desired

Nvidia's products have been recently caught in a brilliant offside trap by ATI (which has reduced its prices drastically), leaving its cards looking overpriced. The Quadro FX 1300 is a great case in point. It sits in the middle of the company's range, offering performance to match.

Nvidia complained that we weren't using its latest beta drivers for testing, as we had with ATI. On re-benchmarking with its own betas, performance jumped – on the tests that worked. Sadly, the 3ds max test didn't. As is often the case, you can have optimal performance or stability, but one comes at the expense of the other.

Nvidia also talked about the card's support for HLSL 3, saying that this distinguished the Quadro from the FireGL because it meant the card could produce better rendering quality. However, at the moment, that should read "theoretically better". We asked Nvidia to provide sample images demonstrating the quality difference, and we're still waiting. It's all very well having the ability to do things better, providing someone produces the software to support it, or you're paying now for promised benefits tomorrow.

Now to measurable performance. In the Maya and Light components of our ViewPerf 8 OpenGL benchmarking suite, the 1300 marginally outperformed the V3200, but in every other test it was slightly better. This means that, on balance, it's the slowest card in our tests. Even its DirectX performance – which, given its support for HLSL 3, you would expect to be optimised – was still half as good as the V3200 using the older, slower drivers. With the new ones, it wouldn't benchmark at all.

This may be an adequate platform for games development but, until we see HLSL 3 supported, and widely implemented by games and consumer cards, the FireGL V3200 makes better economic sense.

VERDICT

PROS

- Dual view for high-res display
- HLSL 3 support

CONS

- Underperforms in comparisons
- Limited memory
- No OpenGL 2

| | |
|-------------------|---|
| RANGE OF FEATURES | 7 |
| VALUE FOR MONEY | 5 |
| OVERALL | 6 |



THIS MONTH'S WINNER

FireGL V5100

With recent price changes, ATI's new middle-of-the-range card has become a very attractive proposition indeed

DETAILS

PRICE
• £430* / \$799 / €625*
*Currency conversion
(All prices exclude VAT)

PLATFORM
PC

MINIMUM SYSTEM
• Pentium 4
• 256MB RAM
• PCI Express bus
• 300 Watt power
• Windows XP/2000

MAIN FEATURES
• Balanced OpenGL & DirectX
• 128MB DDR RAM
• 2 x DVI/analogue monitor outputs
• 128-bit floating point precision
• Max resolution 2,048x1,536 per display
• Dual 400MHz DACs
• OpenGL 2, DirectX 9.x, HLSL 2
• Three-year warranty

MANUFACTURER
ATI

WEBSITE
www.ati.com/firegl



Both Nvidia and ATI have their own shader languages, and both are compatible with

Microsoft's HLSL. ATI's is called ASHLI, and this code was shared with Discreet to enable it to provide better-quality real-time previews within 3ds max.

According to ATI, this means that *max* works best with ATI cards. They pointed us at test after test to prove this, but at no time did we see, nor could we measure, the performance enhancements. Nor was Discreet able to supply us with 3D files that visibly demonstrated the superior image quality of the cards.

However, the fact remains that for the money, the V5100 represents a far better deal than either the V7100 (not reviewed here) or Nvidia's Quadro FX 3400. In fact, in terms of raw performance, the V5100 and 3400 are almost identical, with the V5100 winning on some OpenGL tests and the 3400 on others. The 3400 does come up about 20 per cent faster on the DirectX benchmarks, but when you consider that it costs two and a half times as much, it looks like a pretty poor alternative.

The V5100 has 128MB of DDR1 memory, and in spite of its unified memory architecture, this is its weakest link. Once

the memory runs out, the card will switch over to virtual RAM, spooling data back and forth to your hard drive. This, of course, will have a drastic effect on overall real-time system performance.

The card offers two DVI digital outputs that you can use to connect to

Although the V5100 is close in price to ATI's own V7100, the latter has 16 pipelines instead of the V5100's 12, which enhances its post-processing power. This in turn enables the V7100 to deliver higher image quality by virtue of better antialiasing and anisotropic filtering.

EVEN WITHOUT THE EXTRAS, THE V5100 IS A BETTER DEAL THAN THE QUADRO FX 3400

two LCD panels simultaneously. Unlike the more expensive V7100, you can't connect a single monitor to both ports to increase the maximum resolution – although each monitor can operate at up to 2,048x1,536.

Although graphics cards tend not to need it, the V5100 has a three-year warranty. Three years is generally about the replacement cycle on creative computers, by which time the needs for higher performance exceed the machine's upgradeability.

The card supports version 2 of the OpenGL API, as well as version 1.5 and all flavours of DirectX. It only recognises HLSL 2, but like OpenGL 1.5, we've yet to see the applications that can utilise a higher version.

The V5100 is a pretty good all-round card, offering balanced performance under both OpenGL and DirectX. It doesn't provide blistering performance in either area but, in terms of value for money, it's head and shoulders above the competition.

VERDICT

PROS

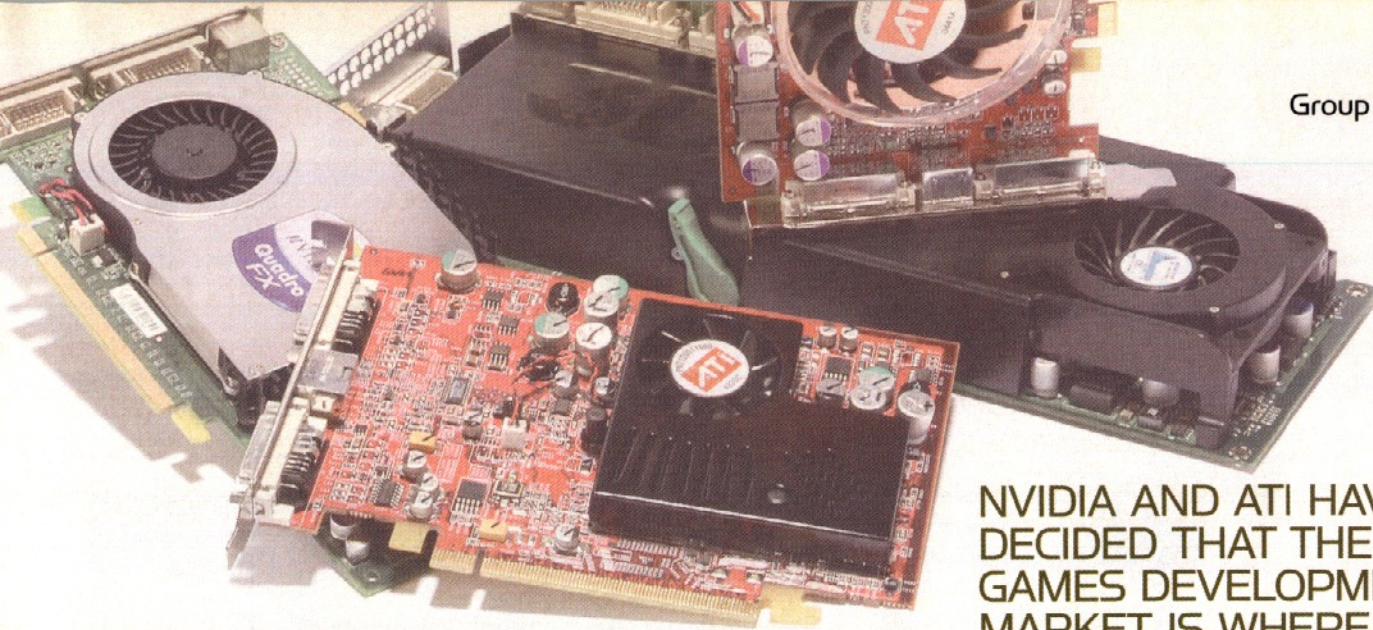
- Good all-round performance
- Good image quality
- Optimised for 3ds max 7

CONS

- No HLSL 3 support

RANGE OF FEATURES
VALUE FOR MONEY
OVERALL

7
9
8



NVIDIA AND ATI HAVE DECIDED THAT THE GAMES DEVELOPMENT MARKET IS WHERE IT'S AT

CONCLUSION | Which graphics card is for you?

This was a really tough set of graphic cards to compare. Of course, there were obvious differences in terms of raw performance, but each graphics card manufacturer fervently argued that this wasn't the real issue - the real issue was about quality. 3DLabs has occupied the high ground there for a long time now, with its advanced filtering, antialiasing and sub-pixel precision all having an effect on the quality of the final image. However, as processing power has increased across the board, these are attributes that all the cards can now attain.

In terms of quality, the battleground now is in the ability to produce subtle shader effects. Shaders are essentially on-the-fly textures that can be created in DirectX to enable the cards to create complex real-world materials, lighting

effects and volumetric atmospherics. Similar effects can be achieved using OpenGL extensions, but these are by no means as widely implemented, nor are there universal OpenGL shader commands.

ATI claims that its collaboration with Discreet enables it to produce the fastest, and most detailed, DirectX viewports in *3ds max 7* - so you don't have to go away and perform test renders every two minutes. Nvidia also targets the games-authoring DirectX market, but the company claims that, because of its support for the latest shader language, its cards can provide more accurate images than the competition.

The problem with both is that there's no visible evidence to substantiate the value of either claim. We see no HLSL 3 support in any applications yet, and if you use *max 6*, you

won't be able to reap the full benefits of ATI's ASHLI language anyway.

It seems clear that Nvidia and ATI have decided that the games development market is where it's at, and both have very much targeted that type of user. However, if you don't use DirectX or shaders, it seems that we're back to the raw performance numbers.

It's a fierce battleground and, as Nvidia proved, well-written drivers can make massive improvements. Card manufacturers don't like to release new drivers for the professional market, often because the users don't like it. However, given that, why weren't finalised and optimised Quadro FX 3400 drivers ready at launch?

Like 3dfx and Diamond before them, we get the impression that Nvidia has momentarily become complacent, and like a true predator, ATI was waiting to pounce. Just when both companies were competing on a level footing technically, ATI has introduced a series of massive price cuts, thus repositioning its entire product line and leaving Nvidia's products looking costly by comparison.

Professional cards are not cheap, and we've long argued that gaming cards offer better value for many users. However, now that ATI has taken the gloves off, the market will never be the same again. We just hope that quality and stability aren't innocent victims.

So, without the evidence to demonstrate the cards' more esoteric benefits, our round-up came down to a simple matter of performance for the money, and by that standard, the winner was obvious. ●

BENCHMARKS | SpecViewPerf 8 and 3DMark 2004

| MODEL | 3DSMAX-03 | CATIA-01 | ENSITE-01 | LIGHT-07 | MAYA-01 | PROE-03 | SW-01 | UGS-04 | 3D MARK |
|----------------|-----------|----------|-----------|----------|---------|---------|-------|--------|------------|
| Realizm 800 | 39.63 | 27.51 | 25.69 | 23.56 | 47.91 | 52.94 | 33.60 | 41.75 | 352 |
| Quadro FX 3400 | 34.20 | 29.83 | 26.27 | 25.98 | 50.78 | 47.75 | 26.07 | 33.58 | 4202 |
| FireGL V3200 | 22.79 | 25.41 | 17.07 | 23.31 | 35.52 | 41.20 | 16.92 | 19.79 | 1561 |
| Quadro FX 1300 | 0.00* | 23.78 | 10.05 | 25.58 | 50.33 | 38.96 | 13.62 | 17.17 | 864 (N/A*) |
| FireGL V5100 | 36.02 | 25.51 | 26.70 | 23.20 | 35.64 | 48.47 | 25.38 | 23.64 | 3525 |

All tests performed on a Dual 3.6GHz Xeon with 2GB RAM. In all cases, higher scores denote a faster card
*See review text for explanation

VITAL STATISTICS

| MODEL | MEMORY | MONITOR OUTPUTS | MAX RESOLUTION | PIXEL PIPELINES | GEOMETRY ENGINES | ANTI-ALIASING | FILTERING | APIs | WARRANTIES | GENLOCK/FRAMELOCK | PRICE | SCORE |
|----------------|-------------|-----------------|----------------|-----------------|------------------|---------------|-----------|-------------------------------|---------------|-------------------|--------|-------|
| Realizm 800 | 640MB GDDR3 | 2 x DVI | 3840x2400 | N/A | N/A | 8x | 8x | OpenGL 2.0, DirectX 9 | 1 year onsite | Yes | £1,500 | 7 |
| Quadro FX 3400 | 256MB GDDR3 | 2 x DVI | 3840x2400 | 16 | 5 | 16x | 8x | OpenGL 1.5, DirectX 9, HLSL 3 | 3 years | No | £893 | 7 |
| FireGL V3200 | 128MB | 2 x DVI | 2048x1536 | 4 | 2 | 6x | 16x | OpenGL 2, DirectX 9, HLSL 2 | 3 years | No | £215* | 7 |
| Quadro FX 1300 | 128MB | 2 x DVI | 3840x2400 | 4 | 3 | 16x | 8x | OpenGL 1.5, DirectX 9, HLSL 3 | 3 years | No | £445 | 6 |
| FireGL V5100 | 128MB DDR1 | 2 x DVI | 2048x1536 | 12 | 6 | 6x | 16x | OpenGL 2, DirectX 9, HLSL 2 | 3 years | No | £430* | 8 |



DETAILS

PRICE

- form•Z £794* / \$1,495
- form•Z RenderZone £1,060* / \$1,995
- form•Z RadioZity £1,273* / \$2,395
- Asterisk denotes currency conversion at current rates

PLATFORM

PC / MAC

MINIMUM SYSTEM

PC

- Win 98
- 128MB RAM
- 50MB HD

MAC

- Mac OS X 10.2
- 128MB RAM
- 50MB HD
- form•Z will work on any processor with the right operating system

MAIN FEATURES

- New parametric primitives
- Improved Sweep, Trim/Split and Stitch tools
- New tools for creating screws, bolts and gears
- Clone/Replace tool
- New Doodle renderer
- Support for HDRi and OpenEXR
- New scripting language

DEVELOPER

auto•des•sys

WEBSITE

www.formz.com

form•Z 5

The learning curve may be steep, but new additions to form•Z's extensive toolset make this one of the best professional modelling packages around **BY MIKE DE LA FLOR**



Within the competitive field of professional modelling and visualisation for architectural and industrial design, form•Z's toolset has long been indispensable. To maintain its edge,

developer auto•des•sys has released form•Z 5, debuting new modelling tools, improved interface and enhanced rendering. Nonetheless, the product faces stiff competition in the shape of rival packages *Amapi Pro* and *solidThinking*.

Though functional, the form•Z interface could be friendlier. Half a dozen palettes, the toolbox and the workspace all open simultaneously, generating visual clutter. Luckily, it can be extensively customised to your taste. To keep things streamlined, form•Z enables you to add and remove toolsets as needed. However, some basic navigation functions, such as Move, Pan and Zoom, are tedious to use: you have to keep moving between the tool and workspace as they have no default keyboard shortcuts. This is an interface that should come with the warning: 'some assembly required'...

MORE THAN ENOUGH

But if you can't find a way to model what you have in mind with form•Z, it probably can't be done. Even for a pro modeller, form•Z's arsenal of tools covers almost every conceivable approach to 3D modelling. A brief list of its modelling tools includes an



• form•Z is not an application for the fainthearted, as it has a steep learning curve. However, once you're over it, the rewards are worth the work: It pays to approach this program with patience

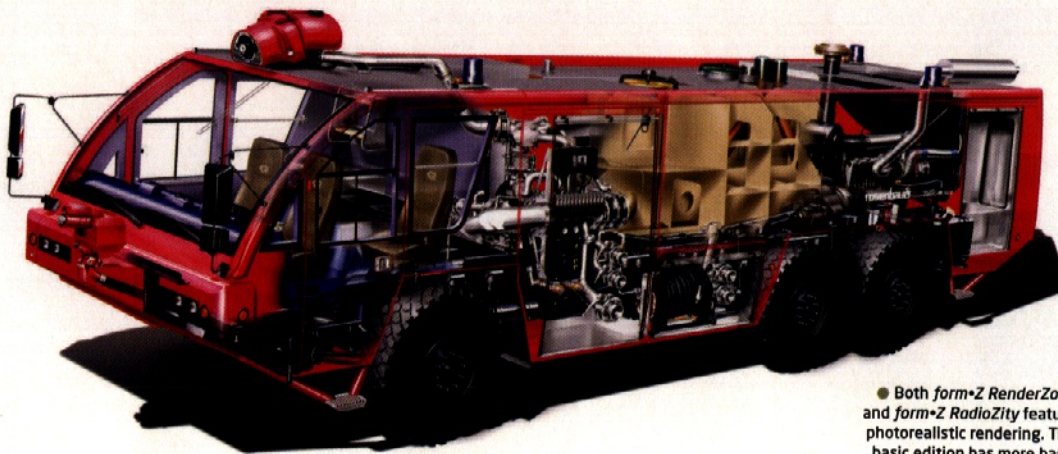
extensive array of parametric primitives, NURBS, patches, Booleans, extensive 2D drawing tools, 3D solids, mesh objects, extrusions, enclosures, sweeps, lofts, skinning, and Sub-D capabilities.

form•Z is one of few applications that's a true hybrid solid and surface modeller, as both types of topology work together and may be combined. However, it's difficult to imagine that anyone would ever use all the modelling tools available. Newcomers will have their hands full; not only with learning all the tools, but getting accustomed to

form•Z's unique approach to modelling.

Nonetheless, once the basics have been mastered, form•Z is a pleasure to work in.

New additions to the already bursting modelling toolset include four new ruled parametric primitives, smooth parametric text, improvements to the Sweep tool, a new Draft Sweep tool and, for the technical illustrator or industrial designer, plug-ins for modelling accurate screws, bolts and gears. Architects will love the handy Frame tool, which creates complex frames or lattices by converting the edges of an object into solid

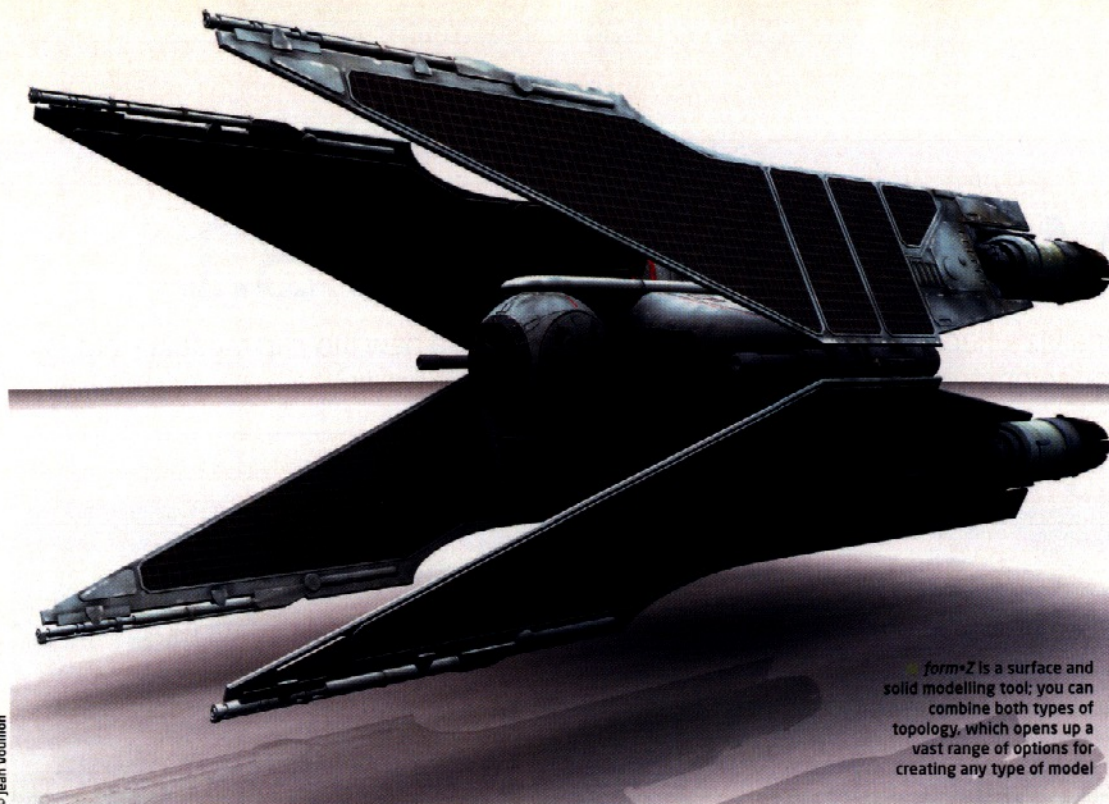


• Both form•Z RenderZone and form•Z RadioZity feature photorealistic rendering. The basic edition has more basic rendering functionality

© Klaus Wagger

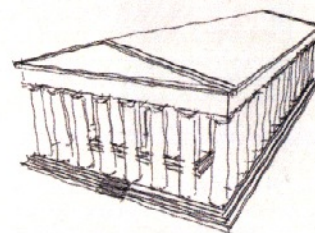
RELATED PRODUCTS

- Amapi 7.5 Pro
- Reviewed: Issue 62



© Jean Vuillon

form•Z is a surface and solid modelling tool; you can combine both types of topology, which opens up a vast range of options for creating any type of model



● form•Z 5 offers the capacity for outputting non-photorealistic, vector-based images, thanks to a brand-new addition: the Doodle renderer



● The render engine is licensed from LightWorks, and it does a marvellous job with raytracing and radiosity

beams. For those interested in tinkering with mathematical formulas to create 3D models (and we can't imagine why), form•Z 5 offers two new tools: the Formula Curve and Formula Surface.

However, while form•Z offers an extensive modelling toolset, it currently has no Construction History. Construction History functions enable users to go back and intuitively experiment during modelling, or correct mistakes – something that auto•des•sys says is in the works for future versions. Also missing is any type of Manifold Modelling tool, which allows the quick creation of complex volumes from intersecting surfaces.

form•Z's Trim/Split and Stitch tools can approximate similar results, but only with rather more mouse clicks.

This release ships in three versions: form•Z, form•Z RenderZone and form•Z RadioZity. The defining difference is the rendering quality: form•Z features very basic rendering, while, at the other end of the scale, form•Z RadioZity has a fully

featured, high-end renderer. However, if you know that you'll use 3ds max, Cinema 4D or another application to render and animate, models, stick to the basic version.

MODEL RIVALRY

The industrial design and architectural modelling and visualisation market is highly competitive, with several companies contending for second place. Why second place? Well, because without dispute, the top spot goes to Alias' StudioTools line of products. Those jostling for second place

On the rendering side, form•Z RadioZity features advanced lighting, radiosity, support for HDRI and a new NPR, vector-based renderer called Doodle. Both form•Z and solidThinking have their render engines licensed from LightWorks, so the only appreciable difference in render quality between the two is the interface.

When compared to Amapi Pro 7.5, form•Z fares better; it has a more complete toolset and features comprehensive solid modelling tools, which are absent in Amapi Pro. However, Amapi's NURBS and Polygonal

Modelling tools rival those found in form•Z. And like solidThinking, Amapi Pro has an awesome

FORM•Z IS A MATURE APPLICATION AND A COMPLETE MODELLING SOLUTION

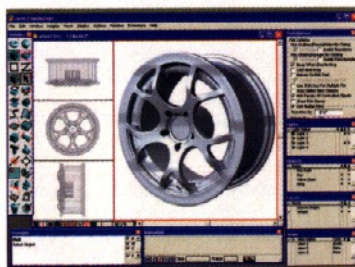
include form•Z, solidThinking, newcomer Amapi Pro 7.5 and Rhino.

When compared head to head, form•Z and solidThinking have similar toolsets. However, the top two products in the solidThinking range, Design (\$2,700) and Vantage (\$4,700), have several advantages. Overall, solidThinking has a better interface and the application is more stable: regrettably form•Z crashes with some regularity and has very specific installation instructions which, if not followed, may cause instability.

Both solidThinking Design and Vantage also feature Construction Histories, and Vantage features a Manifold Modelling tool. As dedicated modellers, both form•Z and solidThinking have limited animation capabilities, but solidThinking slightly edges out form•Z on this score.

Construction History function (called Dynamic Geometry in Amapi-speak) and an excellent Manifold Modelling tool. In addition, for \$779, Amapi Pro comes bundled with an advanced rendering and complete animation module based on Carrara Studio 3 technology.

Criticisms aside, form•Z is an excellent modelling application. Unlike some of its competitors, it is a mature application and a complete modelling solution – though there is room for improvement. As mentioned earlier, it takes focused effort to learn to work in form•Z. To ease the learning curve, auto•des•sys provides several volumes of printed documentation, plus excellent technical support, and the form•Z CD includes completed scenes, models, textures and tutorials. For serious modellers, this is a powerful solution. ●



● The interface needs a lot of customisation before it's ready for you to work, but then you'll be able to model more or less anything

VERDICT

PROS

- Complete modelling solution
- A true hybrid solid and surface modeller

CONS

- Steep learning curve
- Unexpected crashes
- Interface needs customisation

| | |
|-------------------|---|
| RANGE OF FEATURES | 9 |
| VALUE FOR MONEY | 8 |
| OVERALL | 8 |



DETAILS

PRICE

- Standard edition without mo-cap module £2,062* / \$3,500 / €3,000 (for scripting support, add £825* / \$1,400 / €1,200; for floating licence, add £687* / \$1,200 / €1,000)
- Full edition (with mo-cap module and scripting support) £6,873* / \$11,500 / €10,000
- Upgrade to full edition £4,811* / \$8,000 / €7,000
- Asterisk denotes currency conversion at current rates

PLATFORM

PC / MAC / LINUX

MINIMUM SYSTEM

PC

- Windows 2000, XP, NT
- Pentium III 800MHz
- 256MB RAM

MAC

- Mac OS X 10.3
- Power PC G4

LINUX

- Linux Kernel 2.4

MAIN FEATURES

- Auto track and calibration facility
- Motion-capture functionality. Captures data from small number of markers, and from two or more cameras
- Customisable, with user-assisted and full manual tracking ability, and Perl scripting facility
- Matte import ability or creation using built-in tool

DEVELOPER

Realviz

WEBSITE

www.realviz.com

RELATED PRODUCTS

- PFMATCH 1.5
Reviewed: Issue 57
- boujou 2
Reviewed: Issue 30

MatchMover Pro 3.1

Realviz's flagship has dropped its price and added a new mo-cap module - but is the competition now equipped to blow it out of the water? **BY MARTIN SOUTHWOOD**



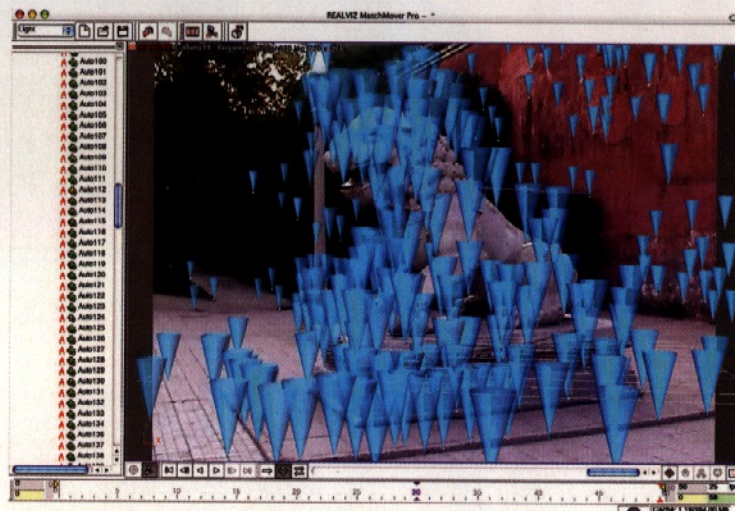
It wasn't until 2001 that the world's first fully automated 3D tracking system became

commercially available, in the guise of *MatchMover 2* from Realviz. This was a huge upgrade from the first edition, which Realviz had released the previous year, and at the time it represented something of a breakthrough.

Now, though, the merging of 2D and 3D in film and video is par for the course: and as the technology has continued to improve, most post-production facilities have incorporated it into their workflow. Discreet embedded the technology into its effects leviathan, *inferno*, showing how 3D tracking is now a standard capability for today's post-production facilities.

Today's industry sees several players jostling for their share of the market. And while *MatchMover Pro* is still evolving, its competitors are no pushovers, and have brought the premium retail value of this technology into question. Late last year, Realviz announced some significant reductions in its own pricing and a new subscription-based lease scheme called 'Absolu' - seen by many as a response to the proliferation of cheaper rivals.

MatchMover Pro 3.1 shows signs of a move towards an inevitable trend reflected elsewhere in the market - to create a complete meta-data model of images, which can then be put to a number of uses. The focal point of this upgrade is therefore the introduction of a motion-capture module. It's a welcome addition, and enables the creation of a mo-cap data model by tracking two or more sequences (which can be of



● Once *MatchMover Pro* has tracked your footage, each of the track points is expanded vertically into a cone representation, offering a better visual impression of the overall track than mere points

mixed frame rate and resolution) of a non-rigid object (i.e. an actor). To avoid any confusion with multiple shots, each one is uniquely colour-coded on import. These can then be synchronised using simple procedures, so *MatchMover* can then calibrate the track data. It's a commendable facility, which enables full manual access through each stage, and users can add info to help make the solution more robust.

PERL ON FILM

Enhancements to *MatchMover's* already versatile interface, such as an advanced Graph Editor (easier to fine-tune) and improved colour-coded information, along with expanded export options and 2D and 3D orientation optimisations, all add up to a smoother user experience. 3.1 also offers fine-tuning options for the high-end user with a Perl-based Script Editor. This allows extensive modification, such as interface customisations, bespoke commands and pre- or post-processing scripts.

Undoubtedly, *MatchMover Pro* is still one of the best auto-tracking systems available. It can take just minutes to achieve a robust, accurate track for export. Its algorithms are fast and powerful, solving almost any shot. The ability to do a quick render of a track to preview its quality feels like a free gift, and adds to the impression

this app gives of being well looked after: future module enhancements will be linked to Realviz *ImageModeler* and the creation of 3D models using 3D track data and textures from footage. In addition, the standard edition (no mo-cap module or Script Editor) now costs €3,000 - about one-third of its previous cost. The full edition, however, is a whopping €10,000.

The release of *boujou bullet* (a much cheaper, but highly functional wizard-based little brother of *boujou*) from 2d3 has made a big impression in this sector, and The Pixel Farm has also pursued the per-pixel data model with the release of *PFMatch* at £600. So there are other options out there, and for many undecided users, it'll take more than a mo-cap module to justify the expense of the full *MatchMover Pro 3.1*. ●

VERDICT

PROS

- Fast, robust 2D and 3D tracking
- Versatile interface
- Motion-capture facility
- Perl scripting module support

CONS

- No object-tracking facility
- Mo-cap module costs a lot extra
- No optical flow facility

RANGE OF FEATURES

8

VALUE FOR MONEY

6

OVERALL

7



● With a single click you can orientate the scene about the camera axis, toggling between 2D and 3D, and even render a *QuickTime* movie



Primatte Keyer 1.6

Primatte Keyer is a bluescreen compositing solution that's easy enough for beginners and good enough for pros. We test-drive version 1.6 **BY CHRIS KENWORTHY**



With *Primatte Keyer* you can quickly remove a bluescreen background from your footage to create pro-quality composites. Used throughout the film and TV industry, *Primatte* is easy to learn, and you can get great results with the first click.

Although an *After Effects* version of *Primatte* has been around for some time, the *combustion* and *Avid* versions have just been released. Keying software of some description is usually bundled with editing and effects programs, but software this good usually costs at least twice the price – often much more.

Whether you shoot your footage in front of a bluescreen, a greenscreen or a grey wall, you'll get good results straight away, which is unusual when it comes to keying. Almost all keying literature stresses the importance of even, careful lighting on the subject and a perfectly lit background. That's still the ideal way to work, but if you make a mistake or shoot a shadow, *Primatte* doesn't struggle.

With many keyers, you use an eyedropper to sample the blue or green background. With *Primatte* you drag the mouse, leaving a trail of points over the range of your screen; this means that all the blues are sampled. A moment later, the blue is gone. It's then a simple case of switching to Matte View to clean up foreground and background noise. Extra tweaks reduce spill and correct edges.

It's fair to say that with no previous experience, you could create a pro-quality matte within minutes of installing the software. Keying often feels more like an art than a craft, but *Primatte* makes it a simple



● In *Primatte*, an unevenly lit bluescreen shot can be made perfect with a single drag of the mouse over light and dark shades. Correcting and improving footage is simple, and unusually quick

task, rather than a time-consuming and somewhat laborious challenge.

But *Primatte* truly excels when it comes to transparent and semi-transparent objects. Whenever you shoot hair, smoke or an actor's glasses, you need software that can cope with the transparency. Although *Keylight* and other similar tools work quite well with very high resolutions, they struggle with transparency in DV footage. *Primatte* copes with transparency, even with DV. You can pour water in front of your bluescreen and it will be successfully composited.

TOOLS FOR THE JOB

The interface offers just the right level of complexity, with enough tools to do the job. If you need to sponge the matte edges or soak up spilled light, the tools are here. For shots with lots of movement and motion

blur you'll need these features, but the process usually just involves dragging your mouse over the offending edges.

Render times are slower than they could be, but the basic responsiveness when you are testing your mattes is fine. The main problem here is that perfecting one frame is never a good way to work. Ideally, you should get a reasonably good result, and watch your entire clip as you attempt to perfect it. With *Primatte*, the slow render times make this tricky, but it isn't impossible.

Overall, although *Keylight* is included in the *After Effects Production* bundle, and *combustion* and *Avid* both come with their own keying tools, *Primatte* is still worth paying for separately. It offers excellent results, and does so almost instantly. ●

VERDICT

PROS

- Great results straight away
- Minimal tweaking required
- Works with poorly shot or badly lit screens

CONS

- Relatively slow render times
- Manuals not detailed enough

RANGE OF FEATURES

8

VALUE FOR MONEY

8

OVERALL

8



DETAILS

PRICE

- *Primatte Keyer for After Effects/combustion/Avid Xpress Pro* £239* / \$445
- *Primatte Keyer for Avid Media Composer* £510* / \$945
- Asterisk denotes currency conversion at current rates

PLATFORM

- PC / Linux
- The OS X version is to be announced soon

MINIMUM SYSTEM

PC

- Win 2000/XP
- Pentium 3 600MHz
- 256MB RAM

MAC

- Mac OS X 10.2
- G4 or higher
- 256MB RAM

MAIN FEATURES

- Adjust foreground colour to remove spill
- Generate mattes with any colour background
- Key transparent objects such as hair, water, and smoke – quickly
- Remove grain in the Alpha channel
- Use the mouse to sample foreground and background areas
- Eliminate spill or correct imprecise edges and transparency – directly in the composition window

DEVELOPER

Red Giant Software

WEBSITE

www.redgiantsoftware.com



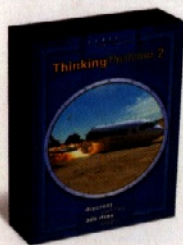
● By switching to Matte View, you can easily remove noise in the background or foreground



● A double shadow on the screen could be a problem, but *Primatte* knocks the shadows out

RELATED PRODUCTS

- *After Effects 6*
Reviewed: Issue 47
- *combustion 3*
Reviewed: Issue 47



DETAILS

PRICE

- £688* / \$1,295 / €1,006*
- Asterisk denotes currency conversion at current rates

PLATFORM

PC

MINIMUM SYSTEM

- Any system capable of running 3ds max 6

MAIN FEATURES

- Fragmentation
- Advanced particle dynamics
- Additional Surface and Position constraints
- Output particles to geometry, including animation
- Texture-based fragmentation
- Particle caching
- Blurr (particle morphing)
- Colour-coded UI
- Particle draw and playback
- Initial Activation behaviour for quick set-up
- MatterWaves

DEVELOPER

Cebas

WEBSITE

www.cebas.com

DISTRIBUTOR

Turbo Squid

DISTRIBUTOR WEBSITE

www.turbosquid.com

RELATED PRODUCTS

- Particle Flow Tools: Box 1
- Reviewed: Issue 58

ThinkingParticles 2

The release of TP2 - The Holy Grail of 3ds max particle systems - allows you to create effects worthy of vampire blockbusters in your own room

BY PETE DRAPER



ThinkingParticles hasn't been around for long, but it almost immediately made itself known as the premier

3ds max particle system. However, it wasn't without its drawbacks - update speeds could be slow and you could seriously bog your computer down with some simple systems.

Version 2 expands on the toolkit with various new and improved features. The main addition is the real-time rigid body dynamics. This takes into account the particle's size, mesh shape, mass and centre of gravity - not just a basic bounding area. Yes, this is pretty much the Holy Grail when it comes to particle systems. It's relatively quick, too, although there is some lag while the mesh is calculated for heavy particle scenes involving fragmentation. This can be cached or baked for fast playback and network rendering.

Now part of the Discreet Certified Plug-in family, you can expect *ThinkingParticles 2*



● Digital Dimension used *ThinkingParticles 2* extensively for the vampire-dusting effects in *Blade: Trinity*. The images above show a breakdown of shots that can now be easily recreated at home

AfterBurn users won't be keen to shell out for another volumetric system, so we await this development with anticipation.

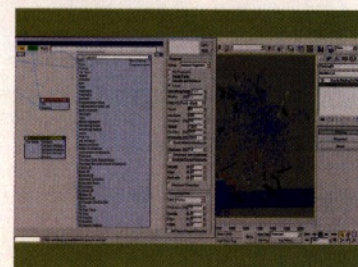
As 3ds max already has an established particle system, *Particle Flow*, most people will have invested time, effort and money in the native tools. This means *TP2* could be considered as being only for the serious particle effects artists - it's a little pricey

TP2 COULD BE CONSIDERED AS BEING ONLY FOR THE SERIOUS PARTICLE EFFECTS ARTISTS

(*TP2*) to be regularly updated and supported. *AfterBurn* users will also be able to use it within *ThinkingParticles*, although at the time of writing this hadn't been implemented (*AfterBurn* currently recognises *TP2* as a particle system, but there's no way to identify an individual group of particles within *TP2*). There is a new version of *PyroCluster* out that works hand in hand with *TP2*, but existing

and you can already do a fair amount in the native system. However, there are a serious number of things at which *TP2* excels that you just can't do in *Particle Flow* - particularly the advanced particle distribution and the amazing real-time fragmentation dynamics. Also, you can build your own tools with *TP2*'s operators.

However, *Particle Flow Tools: Box 2* is on the horizon and this, we're told, caters



● *TP2*'s fragmentation dynamics are impressive, especially given the number of inputs that can drive every single property of the effect

for fragmentation, disintegration and assembly effects. It might be worthwhile waiting to see if this is any match for *TP2*'s dynamics and fragmentation, although we suspect that it may be a bit of a one-sided battle in *TP2*'s favour.

Overall, *TP2* is a good release, though it's quite expensive for the casual user and is exceptionally hard to get to grips with initially if you haven't had any prior experience of using *TP1*. This is a strong upgrade, but the learning curve for the software is still very steep indeed. ●



● *TP2*'s new dynamics engine is quite impressive, with the ability to fine-tune the system to get more accurate results



● Even simple features must be manually designed: *TP2* isn't for the faint-hearted, but serious particle artists will reap the rewards

VERDICT

PROS

- Excellent fragmentation and dynamics system
- Unlimited ability to expand

CONS

- Quite expensive
- Some stability issues

RANGE OF FEATURES

10

VALUE FOR MONEY

8

OVERALL

8



HyperMatter

Put a spring in your step and some bounce in your animations with this capable new soft bodies and advanced real-time dynamics plug-in for Maya

BY JEFF SMART



sers of 3ds max will no doubt have fond memories of this product, which was originally

released some years ago as part of the Digimation range of plug-ins.

HyperMatter was one of the first commercially available programs for creating soft bodies, and it spawned all manner of bouncy and rubbery animations – I remember a colleague of mine once created a rubbery Dalek, of all things!

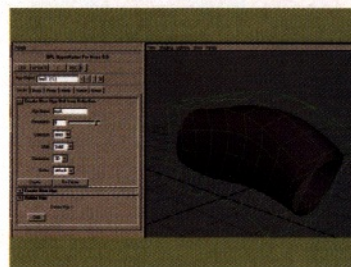
This incarnation of *HyperMatter* has been updated and redeveloped specifically for *Maya*, and the aim is to usurp and surpass *Maya*'s own Soft Bodies engine. But why replace something that's already there? Well, this is without doubt the most impressive soft bodies solution you'll find – outside of the proprietary code written by the likes of ILM, of course.

One of the inherent problems with *Maya*'s Soft Bodies is that they have a nasty tendency to explode on you – usually when you least expect it. They then require much tweaking and careful rigging of

springs, plus further fine-tuning, in order to achieve an acceptable result. *HyperMatter* enables you to achieve Soft Bodies with far less effort and provides very good results. What sort of results can you get? Just think rubber! Imagine all your CG creations made of flexible rubber, distorting, bouncing and reacting with each other, and you'll get the overall idea. Whether you're animating jelly on a plate, bouncy tyres or a virtual Pamela Anderson running down the beach, it's not hard to see the benefits of this program...

RUBBER SOUL

To use *HyperMatter*, you simply assign a *HyperMatter* object to any animated model, and this places a control lattice around the object. Play back the scene and suddenly your object has been rubberised. You can



● A *HyperMatter* object applied to a scene. The resolution of the control lattice around the model determines how floppy it will become

elasticity and the rather George W. Bush-sounding 'incompressibility', which makes your creation more resilient, droopy, solid, and so on. You can also specify the time duration of the *HyperMatter* effect across your animation.

Soft Transforms enable you to animate your *Maya* objects and layer the movements into your *HyperMatter* deformation. This is great because it

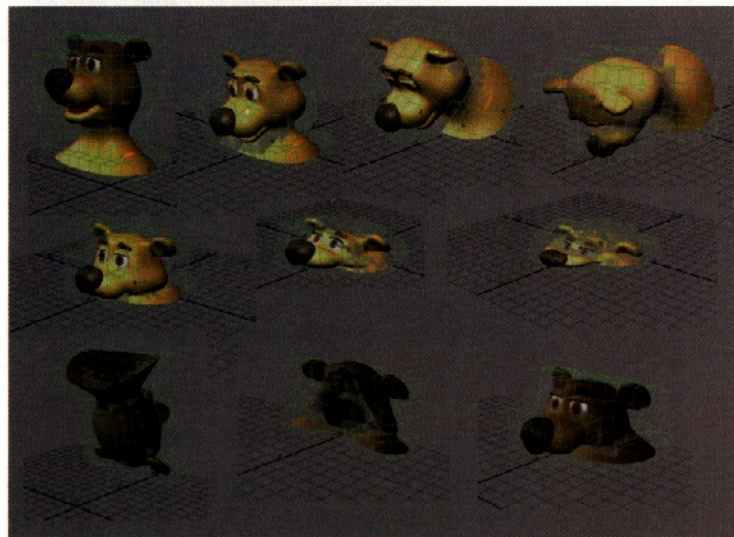
keeps everything together and makes sure that eyes don't pop out of sockets, for example, or that teeth don't poke out through rubbery lips.

The *HyperMatter* Constraint editor enables you to control areas of your object using normal keyframe techniques, such as animating floppy ears on a rabbit. This isn't unlike animating CV clusters on a typical lattice object, in order to affect the movement of a more detailed object underneath. In fact, you could almost do away with bone objects and shape shifts to achieve facial-type animation and use constraint objects instead.

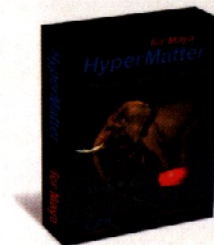
FROM ANIMATING JELLY TO A CG PAMELA ANDERSON, THE BENEFITS OF THE PLUG-IN ARE CLEAR

control the resolution of this lattice and, generally speaking, the higher the resolution, the bouncier and floppier it'll become.

You can also further adjust specific characteristics, such as object density,



● By adjusting specific parameters within *HyperMatter*, you can get your bouncy object to distort, crush and then bounce back with very little effort, as this series of bizarre deformations indicates



DETAILS

PRICE

- £369* / \$695
- Asterisk denotes currency conversion at current rates

PLATFORM

PC

MINIMUM SYSTEM

- A PC capable of running *Maya* 5 or 6

MAIN FEATURES

- Creation of soft bodies in *Maya*

DEVELOPER

One Picture Ltd.

WEBSITE

www.hpermatter.co.uk

VERDICT

PROS

- Simple creation of soft bodies objects
- Very fast real-time update

CONS

- A bit of a one-trick pony, and overpriced for casual users

RANGE OF FEATURES

6

VALUE FOR MONEY

7

OVERALL

7

RELATED PRODUCTS

- *Maya* 6
- Reviewed: Issue 52

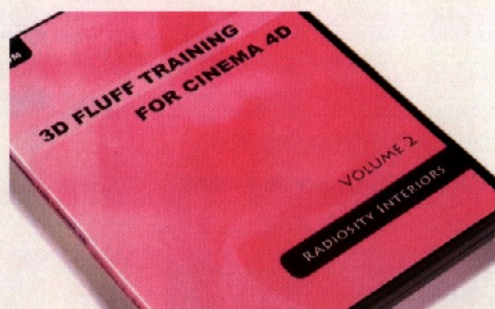
DETAILS

PUBLISHER
3D Fluff

PRICE
£49 / \$90.72* /
€71.25*
(*Currency conversion)

RUNNING TIME
2.5 hours

FOR
Cinema 4D



3D Fluff Training For Cinema 4D: Volume 2

This release from 3D Fluff is *Volume 2: Radiosity Interiors*, and it focuses on using *Cinema 4D's* Advanced Render module to create a radiosity render - a Japanese-themed room (it should really have been called 'Radiosity Interior', singular...).

The DVD goes into extreme detail on using radiosity - how solutions are calculated, advice on how to set up scenes for radiosity lighting, plus tips on improving the overall effect and speeding up render times. It also covers *Cinema 4D's* compositing tags and multipass rendering,

and the final quarter of the disc involves retouching in *Photoshop*.

Like 3D Fluff's first disc, this is packed with info, but it only covers one specific scene. By the end, you wish you could see these tips applied in different situations. And because of the overall attention to detail - fussing over the tiniest elements - it can get a little ponderous at times. ●

VERDICT

A solid release, but the focus on one scene, plus the £49 price tag, may put some users off **7**

DETAILS

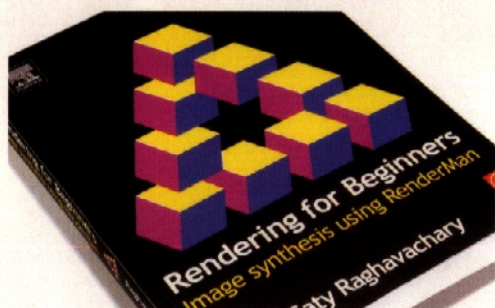
AUTHOR
Saty Raghavachary

PUBLISHER
Focal Press

PRICE
£29.99 / \$39.95 /
€31.03*
(*Currency conversion)

PAGES
384

ISBN
0-240-51935-3



Rendering For Beginners

At first flick, *Rendering For Beginners: Image Synthesis Using RenderMan* seems like a text-heavy, code-heavy, beast of a book - a companion that could occupy users of Pixar's renderer for weeks. But author Saty Raghavachary has aimed to keep things simple: "A non-technical guide you don't need a maths degree to follow..."

It begins with a history of *RenderMan*, before moving on to RIB (*RenderMan* Interface Bytestream) files, geometry generation, manipulating cameras, plus colouring, texturing and shading - all with

colour illustrations. It covers all versions of the app and is aimed at a variety of readers, from those working in a CG production studio to hobbyist animators or devoted 'RenderManiacs'. Because of its depth, it is likely to please all of these groups.

For more information, visit the book's accompanying website: www.smartcg.com/tech/cg/books/RfB. ●

VERDICT

A thorough guide to *RenderMan* for new users, which will also appeal to its ardent fans **7**

DETAILS

PUBLISHER
The Gnomon Workshop

PRICE
£37* / \$69 / €54*
per DVD
(*Currency conversion)

RUNNING TIME
Approx 2 hrs each plus
40 mins bonus footage

FOR
Natural media



The Techniques of Syd Mead: Volumes 1-4

There can be few 3D artists who are unfamiliar with the futurist work of Syd Mead. This collection of four DVDs follows his work on the production of a single rendering - though in the gouache sense, rather than raytracing.

As such, the collection presents a fascinating journey from rough thumbnail sketches, experimenting with light and shade, through to trial colour schemes and the final, beautifully precise artwork itself.

However, what it doesn't do is explore Mead's inspirations or his methodology for

the generation of design ideas, which is probably what most fans would like to see. It also occasionally falls short on technique; how Mead deals with the interplay of light and dark in bas relief, or his choice of colour palette for different materials. It's heavy on the how, but light on the why. You'll no doubt be inspired, but probably to pick up a Windsor & Newton watercolour brush... ●

VERDICT

A great examination of an illustrator at work, but there's not a lot for 3D artists here **6**

DETAILS

AUTHOR
Michael McKinley

PUBLISHER
The Maya Press

PRICE
£27.99 / \$39.99 /
€31.03*
(*Currency conversion)

PAGES
240

ISBN
0-7821-4376-8



The Game Artist's Guide to Maya

This slim little number doesn't make a good first impression. Perhaps it's the lack of colour imagery, or the fact that it costs a pricey £27.99 for just 223 pages - in stark comparison to the 400-page *RenderMan* bible reviewed previously.

However, this official Alias text is packed with tutorials and advice for game artists - accompanied by *Maya 6 PLE* on its CD, and a host of models, textures, videos and resource files. The tutorials are well laid out and easy to follow, with plenty of screenshots on every page - this is clearly

the book's strength. It covers real-life tasks that game artists deal with on a daily basis, explains the industry and the positions available, and profiles leading *Maya* artisans.

Those who already possess some *Maya* skills can follow step-by-step guides to polygon modelling, texturing, rigging, animation and particle effects, making their way through the game-art pipeline. ●

VERDICT

A useful, industry-grounded resource for aspiring game artists, with tutorials galore **8**

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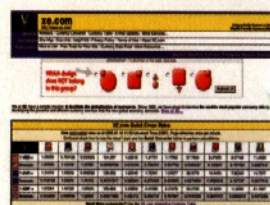


myfavouritemagazines.co.uk

Buyers' guide

Whether you want advice on choosing a specific software package, or an overview of what's on the market, this database of past 3D World reviews contains the information you need to make the right buying decision

Online Resources



● This guide lists prices in Pounds Sterling and US Dollars. For a quick currency conversion: www.xe.com



● We don't cover non-3D software. For full reviews of complementary products: www.computerarts.co.uk

When new 3D users contact the magazine, the most common question they ask is: "Which software package should I buy?" To which the honest response is: "That really depends on you."

Unlike Web design or 2D illustration, there's no single, well-established software package that all professionals use. Instead, choosing a 3D application is largely a matter of personal requirements, not to mention individual taste. Before you begin downloading demos, however, it does help to have a broad overview of what's available – and that's where this buyers' guide comes in.

In this guide, you'll find a list of the key software packages in each particular market sector, the issue of the magazine in which it featured and a brief summary of the review. These summaries represent a single reviewer's opinion, but they should give you an idea of the key characteristics of each application.

QUESTIONS, QUESTIONS...

Before diving in, there are two fundamental questions you should ask. Firstly, are you pursuing 3D as a professional career? And secondly, what kind of 3D work do you aim to produce?

If the answer to the first question is 'no', the only limitations on your choice of 3D software are your budget and operating system. In the hands of a skilled user, inexpensive applications can generate impressive results, although they might not do so as quickly as more expensive software (or in a way that professional 3D artists would deem conventional).

If you do aim to make a living in 3D, however, you'd be well advised to pick a 'professional' application: those listed in the upper table on the page opposite. Expensive packages don't necessarily generate better results, but they tend to produce work quickly,

flexibly and reliably – all important issues if deadlines are looming. And while studios don't usually hire staff solely on the basis of the software they've used, mastering a 'name' application will familiarise you with high-end tools and increase your chances of freelance work.

Another consideration is whether you intend to produce animations or still images. As a crude generalisation, illustrators and graphic artists often favour pro applications at the lower end of the price scale, while those working in animation, visual effects or game design tend to opt for more expensive packages.

Ultimately, however, there's no substitute for hands-on experience. All major applications have demo versions that you can

CHOOSING APPLICATIONS IS ALL ABOUT PERSONAL REQUIREMENTS AND INDIVIDUAL TASTE

download and experiment with, and before you reject the more expensive packages, remember that many of them – particularly *Maya*, *Houdini*, *LightWave* and *Softimage|XSI* – have free 'learning' editions. Educational deals also offer students the chance to buy full versions of professional software for the price of a handful of DVDs: to see if you qualify, check the website of the software package you're interested in.

Fortunately, there are very few 'bad' 3D packages on the market, so choosing the right one for you ultimately comes down to personal taste. Do your research, consult the magazine, be prepared to experiment – but above all, enjoy yourself!

ALL-ROUND 3D PACKAGES (UNDER £250)

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|-----------------------------|--------|--|----------------|-------------------|--|-------|---|-------|
| AIST MOVIE 3D | PC | Cut-down version of <i>Realsoft 3D</i> , aimed mainly at home movie makers dabbling in 3D | £68* (\$132*) | AIST | www.aist.com | N/A | [Not previously reviewed in 3D World] | N/A |
| CARRARA 3D BASICS | Mac/PC | Extremely stripped-down version of a mid-price app, aimed at hobbyists and casual users | £39 (\$49) | Eovia | www.eovia.com | N/A | [Not previously reviewed in 3D World] | N/A |
| CARRARA 4 STANDARD | Mac/PC | Inexpensive all-rounder, lacking some of the high-end tools from <i>Carrara 4 Professional</i> | £209 (\$279) | Eovia | www.eovia.com | 60 | Still a solid purchase for a novice all-round 3D user on a budget, <i>Carrara 4</i> fixes bugs from earlier versions, but lacks the new rendering tools of the <i>Pro</i> edition | 8 |
| GAMESPACE | PC | Cut-down <i>trueSpace</i> with extra games tools, aimed at modders and indie game developers | £154* (\$209) | Caligari | www.caligari.com | 46 | Goes some way to providing a one-stop solution for the mod community, but one with rough edges on release: those on a real budget may stick to freeware | 7 |
| HASH ANIMATION:MASTER | Mac/PC | Cult entry-price animation app, chosen by many leading animators for personal work | £154* (\$209) | Hash Inc. | www.hash.com | 59 | Powerful, intuitive rigging and animation package, complemented by a simple, versatile modeller. Now adds hair support and a sprite-based particle system | 9 |
| PIXELS 3D 5 | Mac | The premier – and possibly, only – Mac-only 3D package: a cult app amongst Mac fans | £77* (\$149) | Pixels Digital | www.pixelsdigital.com | 42 | Great value for money, and includes a number of high-end tools, including fluids and cloth. Good render quality, but very slow, and workflow could be improved | 8 |
| REALSOFT 3D 4.5 (FOR LINUX) | Linux | Even better value than the PC edition: most Linux users' main alternative to freeware | £140* (\$270*) | Realsoft Graphics | www.realsoft.com | 35 | Excellent render quality for the price, but more suited to still images than animation work, particularly character animation. OpenGL could be improved | 9 |
| SHADE 7 DESIGNER LE | Mac/PC | Very inexpensive, if limited, all-round package, extremely popular with hobbyists in Japan | £56* (\$109) | Curious Labs | www.curiouslabs.com | 58 | Clearly geared towards the student or amateur, this cheap and cheerful version of its bigger siblings shares the basic modelling tools but is otherwise limited | 7 |
| SHADE 7 STANDARD | Mac/PC | Mid-level edition: more expensive than LE, but lacks some key tools of <i>Shade 7 Pro</i> | £107* (\$209) | Curious Labs | www.curiouslabs.com | 58 | Similar in toolset to the <i>Professional</i> edition, but lacks automatic smoothing and interpolation. A reasonable buy, if you can handle the translation issues! | 7 |



ALL-ROUND 3D PACKAGES (OVER £250)

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|----------------------------|--------------|--|--------------------|-----------------------|--|-------|---|-------|
| 3DS MAX 7 | PC | Long-established 3D package: still a standard in the games and architecture industries | £2,695 (\$3,495) | Discreet | www.discreet.com | 59 | No major 'hero' features, but improved stability, integrated character studio, and new Normal Mapping and character animation tools make this a worthy upgrade | 9 |
| CARRARA 4 PRO | Mac/PC | Inexpensive all-round app, now targeted more specifically at professional illustrators | £419 (\$579) | Eovia | www.eovia.com | 60 | Retains Eovia's unique – and possibly offputting – system of workflow divided between 'rooms', but dramatically improves animation and high-end rendering | 8 |
| CINEMA 4D 9 BASE | Mac/PC | Entry-level edition only: some important tools must be purchased as add-on modules | £425 (\$695) | Maxon | www.maxon.net | 58 | Not as ground breaking an upgrade as version 8, but builds on previous incarnations to deliver a capable all-round professional 3D package | 9 |
| CINEMA 4D 9 XL | Mac/PC | A powerful renderer makes this increasingly respected app the choice of many illustrators | £1,140 (\$1,895) | Maxon | www.maxon.net | 50 | [This edition not specifically reviewed in 3D World] Pricier than LightWave, but the MOCCA and Advanced Render modules are essential to many pro artists | 9 |
| CINEMA 4D 9 STUDIO | Mac/PC | Top-level edition of Cinema 4D, adding in BodyPaint 2 and unlimited network rendering | £1,871 (\$2,995) | Maxon | www.maxon.net | 58 | [This edition not specifically reviewed in 3D World] Primarily for large facilities needing unlimited render licenses, although BodyPaint is a useful added extra | 9 |
| EIAS 5.5 | Mac/PC | Perennial professional-quality animation package with a strong cult following | £463* (\$695) | Ei Technology Group | www.eitechnologygroup.com | 59 | Still an insanely fast rendering and animation package, but now minus a built-in modeller since the last – admittedly thorough – point-five upgrade | 8 |
| HOUDINI 7 SELECT | PC/Linux | Entry-level edition, primarily aimed at studios looking to build a lower-cost Houdini pipeline | £825* (\$1,599) | Side Effects Software | www.sidefx.com | 25 | [Reviewed at version 5] A good additional seat for a Houdini studio, but lack of advanced and character animation tools limit its use as a standalone package | 7 |
| HOUDINI 7 MASTER | PC/Linux | Powerful procedural animation package; few skilled users, but a staple of much VFX work | £8,769* (\$17,000) | Side Effects Software | www.sidefx.com | 41 | [Reviewed at version 6] Retains all the power of previous versions, but makes considerable advances in terms of ease of use. Also adds GI rendering | 8 |
| LIGHTWAVE 3D 8 | Mac/PC | Another long-established package, used in a wide range of work, notably TV effects | £995 (\$1,595) | NewTek | www.newtek.com | 53 | Vastly improves character animation and dynamics, and streamlines workflow, but leaves the renderer and underlying structural problems of the app untouched | 8 |
| MAYA 6 COMPLETE | Mac/PC/Linux | Lacks some high-end tools, but an affordably priced edition of Maya for many 3D markets | £1,499 (\$1,999) | Alias | www.alias.com | 52 | Despite better mental ray and Photoshop integration and a 'soft modification' modelling tool, Maya 6 features relatively little new for users of Complete | 8 |
| MAYA 6 UNLIMITED | Mac/PC/Linux | Powerful all-round package: still the one to beat when it comes to film effects work | £4,899 (\$6,999) | Alias | www.alias.com | 52 | Powerful new 'dynamic curves' tools (for hair), and improved cloth, particles and animation editing make Maya 6 a much stronger proposition for Unlimited users | 8 |
| REALSOFT 3D 5 (FOR PC) | PC | Underpublicised, but well-regarded, mid-priced application; good built-in renderer | £415* (\$795*) | Realsoft Graphics | www.realsoft.com | 61 | Enhanced Sub-D modelling and texturing make this a viable alternative to better-known 3D illustration apps. Still weak at character animation, however | 9 |
| SHADE 7 PRO | Mac/PC | Very popular Japanese package. Still relatively unknown in the West, but may gain ground | £521* (\$1,009) | Curious Labs | www.curiouslabs.com | 58 | Robust modelling tools and a reasonably powerful renderer, but the interface and animation tools will seem unconventional to many Western 3D artists | 7 |
| SOFTIMAGE XSI 4 FOUNDATION | PC/Linux | Aggressively marketed entry-level edition of a leading 3D app: very powerful for the price | £299 (\$1,995) | Softimage | www.softimage.com | 55 | Fuller featured than many entry-level editions of major packages. Foundation – originally sold for \$1,995 – sets a new benchmark for 3D software pricing | 9 |
| SOFTIMAGE XSI 4 ESSENTIALS | PC/Linux | Powerful, well-balanced all-round package, also much reduced in price over the last year | £1,275 (\$1,995) | Softimage | www.softimage.com | 55 | A solid upgrade to a powerful package, adding new rigid-body dynamics, a fully non-linear modelling workflow and improved texturing and materials tools | 9 |
| SOFTIMAGE XSI 4 ADVANCED | PC/Linux | Widely used in games and VFX, but struggles for market dominance with 3ds max and Maya | £4,485 (\$6,995) | Softimage | www.softimage.com | 55 | For power users, XSI 4 Advanced also throws in BatchServe and eight satellite render licences for free. Still no decent NURBS or curve tools, though | 9 |
| STRATA 3D CX | Mac/PC | Long-established, if relatively niche, mid-price 3D package: now targeted at illustrators | £346* (\$695) | Strata | www.strata.com | 55 | A capable, if idiosyncratic, package for a print graphic artist looking to team Photoshop and Illustrator with a little 3D. Far weaker for animation, however | 7 |
| TRUESPACE 6.6 | PC | Another fixture in the increasingly crowded mid-price 3D software market, still widely used | £310* (\$595) | Caligari | www.caligari.com | 38 | Improving animation and dynamics, version 6.6 addresses many of TrueSpace's shortcomings, but the current interface now looks to have reached its limits | 8 |

TEXTURING

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|------------------|--------|---|----------------|------------------|--|-------|--|-------|
| BODYPAINT 3D 2 | Mac/PC | Powerful specialist 3D painting package, used on increasingly high-profile VFX projects | £425 (\$745) | Maxon | www.maxon.net | 47 | Much quicker and simpler to use than the first release, and results can be stunning. Rock solid and well documented, but one for specialist texture artists | 9 |
| DEEP PAINT 3D 2 | PC | Established 3D painting app, but not recently updated, and losing headlines to BodyPaint | £307* (\$595) | Right Hemisphere | www.righthemisphere.com | 26 | Powerful, but RAM-hungry, and advanced mapping tools are presented in a separate app. Deep UV. Not recently updated, however, unlike BodyPaint 3D | 8 |
| PAINT SHOP PRO 9 | PC | Inexpensive 2D painting and bitmap editing app, unfairly regarded as 'just for hobbyists' | £99.95 (\$129) | Corel | www.corel.com | 57 | Fantastic value for money, and version 9 adds a proper History palette. Does nearly anything that Photoshop can, but needs better Alpha channel support | 9 |
| PHOTOSHOP CS | Mac/PC | The de facto standard for texture painting and image manipulation amongst CG artists | £515 (\$649) | Adobe | www.adobe.com | 48 | Still de rigueur for professional 3D work. Few must-have features for 3D users in the latest release, but integrated photo stitching and Match Colours are handy | 8 |

TALKING POINT | Photoshop vs Paint Shop Pro

FOR MANY ARTISTS, the terms '2D software' and 'Photoshop' are synonymous. Adobe's image-editing package forms a clear industry standard. But it's an expensive application, with Photoshop CS currently retailing at £515 (\$649). If you're on a budget (and own a PC) there's a cheaper alternative: Paint Shop Pro. At under a fifth the price of Photoshop, PSP is unfairly regarded as a

'hobbyist's package'. Used by many professionals in their personal work, Paint Shop Pro is fast, packed with a range of filters, brushes and vector tools. Its only major weakness is its lack of support for Alpha channels. If you use Alpha channels regularly, Photoshop may be the best option. If not, switching to PSP will save you £400. Paint Shop Pro 9 was reviewed in Issue 57

MODELLING

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|------------------|----------|--|-------------------|----------------------------|---------------------------|-------|--|-------|
| AC3D | PC/Linux | Low-cost modeller with poly, Sub-D and Boolean tools, mainly aimed at games work | £25.65* (\$49.95) | Inlvis | www.ac3d.org | N/A | [Not previously reviewed in 3D World] | N/A |
| AMAPI DESIGNER 7 | Mac/PC | Long-established modelling package, boasting a unique workflow and interface | £339 (\$479) | Eovia | www.eovia.com | 40 | A powerful modelling package, particularly for organic objects, although users will either love or loathe the interface, and documentation could be improved | 9 |
| AMAPI 7.5 PRO | Mac/PC | Amapi Designer's new bigger sibling, intended as a serious alternative to pricier applications | £559 (\$779) | Eovia | www.eovia.com | 62 | Professional version of Amapi, aimed at industrial modelling. Awesome Dynamic Geometry and better NURBS modelling but tool/command validation is tricky | 9 |
| AMORPHIUM 3 | Mac/PC | Blob-based modelling package, very popular with hobbyists, but not recently updated | £76* (\$149) | Ei Technology Group | www.eitechnologygroup.com | 35 | A unique organic modelling package, only basic Sub-D tools, a slow renderer and a rather clunky interface, but what it does do, it does extremely well | 8 |
| FORM+Z 5 | Mac/PC | Powerful, long-established all-round modeller, used on a wide range of industrial projects | £794* (\$1,495) | Auto+des+sys | www.formz.com | 40 | [Reviewed at version 4] Premium modelling package. Strong NURBS tools and a decent renderer, but workflow can be slow and sometimes needlessly complex | 7 |
| MOD0 | Mac/PC | Powerful, customisable and Mac-friendly new Sub-D modeller, created by ex-NewTek staff | £359* (\$695) | Luxology | www.luxology.com | 60 | A relatively pricey addition to a crowded market sector, but one with a uniquely customisable modular design. Some early stability issues, but improving rapidly | 8 |
| RHINO 3 | PC | Another well-established app, at the lower end of the price scale for industrial modellers | £462* (\$895) | Robert McNeel & Associates | www.rhino3d.com | 36 | New NURBS tools and shading modes make this package a strong all-rounder. Will soon need upgrading to keep pace with newer competitors, however | 8 |
| SILO 1.3 | Mac/PC | New specialist Sub-D modelling package, inexpensive, and improving with every build | £56* (\$109) | Nevercenter | www.nevercenter.com | 55 | Has evolved into a promising app, following early stability issues. Quirky UV mapping, but good crossover between Sub-D and poly tools, and customisable | 9 |
| ZBRUSH 2 | Mac/PC | Powerful, intuitive organic modelling package currently gaining very strong word of mouth | £252* (\$409) | Pixologic | www.zbrush.com | 53 | A new interface helps redefine ZBrush 2 as a professional 3D sculpting tool. Still some quirks, but many unique tools and capable of handling millions of polys | 9 |

CHARACTER AND FACIAL ANIMATION

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|-------------------------------------|--------|---|---------------------|----------------------|------------------------|-------|---|-------|
| DAZ STUDIO | Mac/PC | Long-awaited new rival to Poser, currently still available as a free public beta | Free | DAZ Productions | www.daz3d.com | N/A | [Not previously reviewed in 3D World] | N/A |
| ENDORPHIN 1.6 | PC | Innovative 'motion-synthesis' system using AI 'actors' to generate artificial mo-cap data | £7,995 (\$12,975) | NaturalMotion | www.naturalmotion.com | 56 | Brilliant, technically accomplished, and fun to use, to boot. Generates data no real-world stuntman could achieve, and now supports multiple characters | 9 |
| FACESTATION 2 | PC | Turn video footage of an actor's face into instant animation, for 3ds max and Maya | (£1,041* (\$1,995)) | Digimation | www.digimation.com | 33 | Fast facial tracking, and can work with real-time capture. Resource hungry, however, and the quality of the results is only as good as your morph targets | 8 |
| LIFESTUDIO:HEAD 2.5 STANDARD EDITOR | PC | Customise a pre-built head model, apply instant lip synch and export as OBJs or an AVI | £310 (\$599*) | LifeMode Interactive | www.lifeml.com | 44 | Good texturing tools, but some tweaking is required to finesse the lip synch generated automatically from an audio track. Manual and UI need tidying up | 8 |
| LIFESTUDIO:HEAD 2.5 PRO ARTIST | PC | Create and rig facial models for 3ds max and Maya, then apply instant lip-synching | £990 (\$1,914*) | LifeMode Interactive | www.lifeml.com | 44 | As the Standard Editor, but with the power to import/export directly to Maya or 3ds max. One of the first proper tools of this kind, a time-saver for games artists | 8 |
| MESSIAH:ANIMATE 5 | PC | Powerful standalone animation package, also available as a plug-in for major 3D packages | £125* (\$259) | pmG Worldwide | www.projectmessiah.com | 29 | [Reviewed at version 3] A comprehensive character animation solution with very fast IK and deformation and powerful expressions. Now reduced in price | 8 |
| MESSIAH:STUDIO 2 | PC | messiahanimate's larger parent product, adding in full rendering capabilities | £518* (\$995) | pmG Worldwide | www.projectmessiah.com | 58 | Not an industry-standard application (and lacks modelling tools), but offers intuitive, fast and powerful GI rendering and is capable of some amazing results | 7 |
| MOTIONBUILDER 6 STANDARD | Mac/PC | Innovative 'motion design' package, originally developed by Kaydara, now owned by Alias | £532* (\$995) | Alias | www.alias.com | 46 | [Reviewed at version 5] Powerful FK/IK blending and real-time playback, plus a new Story Window to keep things organised. Quickly becoming indispensable | 9 |
| MOTIONBUILDER 6 PRO | Mac/PC | Pro motion-editing app: an industry standard for blending mo-cap and keyframe data | £2,244* (\$4,195) | Alias | www.alias.com | 62 | High-end tools include mo-cap data editing and data retargeting. It might be a tad expensive, but it's probably the best character animation tool around | 8 |
| POSER 5 | Mac/PC | The original figure-posing application, also used for pre-viz and simple animation work | £108* (\$209) | Curious Labs | www.curiouslabs.com | 45 | New hair and cloth, and a versatile new renderer, but many rough edges from earlier versions remain, while the animation tools now need overhauling | 6 |

RENDERING

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|---------------------|---------------|--|-------------------|-----------------|-------------------------|-------|--|-------|
| AIR | PC/Linux | RenderMan-compatible hybrid scanline/ raytrace renderer, used in film and stills work | £231* (\$450) | SiTex Graphics | www.sitexgraphics.com | N/A | [Not previously reviewed in 3D World] | N/A |
| ART+LANTIS 4.5 | Mac/PC | Old-school architectural rendering package, now awaiting an update to version 5.0 | £349 | Abvent | www.abvent.com | 13 | This interactive package is capable of high-quality results and provides decent renders quickly, without fuss. Few fine controls, though, and not recently updated | 7 |
| BRAZIL R/S | PC | Powerful 3ds max renderer, used in both stills and effects work: soon to be ported to Maya | £617* (\$1,200) | SplutterFish | www.splutterfish.com | 31 | Fast and robust, with an excellent shader system, delivering high-quality results. Bucket rendering allows fast distributed rendering across a network | 9 |
| FINALRENDER STAGE-1 | PC | Another powerful 3ds max renderer, often used in architectural visualisation work | £415* (\$795) | Cebas | www.finalrender.com | 43 | Powerful new HyperGI engine and caustics tools, but exceptional results require a lot of tweaking. Some instabilities, particularly in distributed renders | 7 |
| MENTAL RAY 3 | Mac/PC/ Linux | A built-in renderer in 3ds max, Maya and XSI, usually used for stills or short-form work | Licensed for use | mental images | www.mentalimages.com | N/A | [Not previously reviewed in 3D World] | N/A |
| POV-RAY | Mac/PC/ Linux | Justifiably popular freeware 3ds max renderer, capable of very high quality results | Free | POV-Ray | www.povray.org | N/A | [Not previously reviewed in 3D World] | N/A |
| RENDERMAN 12 | Mac/PC | Pixar's rendering workhorse for production pipelines: the standard for film effects work | £1,808* (\$3,500) | Pixar | renderman.pixar.com | N/A | [Evaluated at version 11] Fast, excellent memory usage and a well-documented shader language. Now incorporates GI rendering tools and selective raytracing | N/A |
| TURTLE | Mac/PC/ Linux | Third-party Maya renderer, designed to offer a new balance of speed and image quality | £619* (\$1,199) | Illuminate Labs | www.illuminateilabs.com | 55 | Blisteringly fast raytrace rendering. Currently best suited to architectural work, due to lack of support for particles and Paint Effects, but developing rapidly | 7 |
| V-RAY | PC | Lower priced rival to Brazil: a third-party 3ds max renderer for stills and effects work | £154* (\$299) | Chaos Group | www.vrayrender.com | N/A | [Not previously reviewed in 3D World] | N/A |

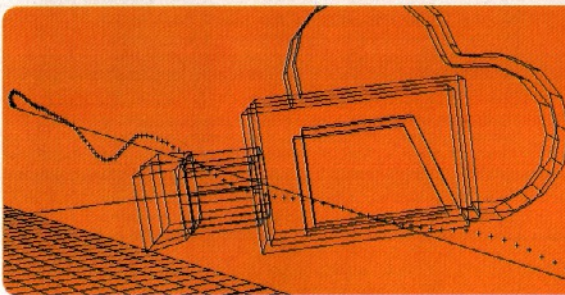


COMPOSITING AND EFFECTS

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|------------------------------|-----------|--|-------------------|----------------|-------------------|-------|--|-------|
| AFTER EFFECTS 6 STANDARD | Mac/PC | One of the most popular desktop compositing packages, usable even for broadcast work | £565 (\$699) | Adobe | www.adobe.com | 47 | Updated video painting features, plus the addition of Photoshop's Liquefy tool make for a major upgrade. Still the same cluttered old interface, however | 8 |
| AFTER EFFECTS 6 PROFESSIONAL | Mac/PC | As <i>After Effects Standard</i> , plus some high-end tools, worth investing in for professional work | £915 (\$999) | Adobe | www.adobe.com | 47 | Motion tracking, enhanced keying and masking, particle systems and 16-bit colour tools make this a better option than <i>AE Standard</i> for serious 3D work | 8 |
| COMBUSTION 3 | Mac/PC | Discreet's own desktop compositor, unsurprisingly often teamed with <i>3ds max</i> | £877.25 (\$995) | Discreet | www.discreet.com | 47 | Better particle tools and connectivity with 3D software than <i>After Effects</i> , plus a strong colour keyer, but limited text tools and a relatively steep learning curve | 9 |
| DFX+ 4 | PC | Cut-down, modular version of <i>Digital Fusion</i> , much beloved of PC-based <i>LightWave</i> artists | Priced by module | eyeon Software | www.eyeonline.com | 43 | Most of the improvements in version 4 are cosmetic, but still a powerful, affordable, node-based compositing app. Good visual effects and 3D tools | 8 |
| DIGITAL FUSION 4 | PC | One of the first PC-based desktop compositing packages, but still relatively little known | £2,579* (\$4,995) | eyeon Software | www.eyeonline.com | 43 | Not limited to 8-bit colour space, unlike <i>DFX+</i> , making this a powerful – and underrated – PC-based compositor, capable of scaling to film-quality work | 8 |
| MOTION | Mac | Entry-level motion-graphics package, suitable for simple compositing, titling and effects | £199 (\$299) | Apple | www.apple.com | 61 | Good masking and particle tools; not simply a cut-down version of <i>After Effects</i> . No tracking or true 3D layers, though, and the interface can be sluggish | 8 |
| SHAKE 3.5 | Mac/Linux | Powerful node-based desktop compositor, used even in film and broadcast effects | £2,099 (\$2,999) | Apple | www.apple.com | 54 | The most powerful desktop compositor on the market, with the possible exception of <i>Digital Fusion</i> . Version 3.5 adds long-awaited morphing tools | 8 |

CAMERA TRACKING AND MATCH MOVING

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|------------------|--------------|---|--------------------|----------------------------|------------------------|-------|--|-------|
| 3D-EQUALIZER 3 | Mac/Linux | Venerable (and Oscar-winning) tracking package, still widely used in film effects | On request | Science-D-Visions | www.3dequalizer.com | N/A | [Not previously reviewed in <i>3D World</i>] | N/A |
| BOUJOU 3 | Mac/PC/Linux | One of the first major alternatives to <i>3D Equalizer</i> , popular in the effects world | £5,141* (\$10,000) | 2d3 | www.2d3.com | 30 | [Evaluated at version 2] Generates excellent results, and a relatively shallow learning curve. The new Gold Tracks feature significantly raises user control | N/A |
| BOUJOU BULLET | Mac/PC/Linux | Cut-down, wizard-driven version of <i>boujou</i> , intended for small to medium-sized facilities | £1,300* (\$2,500) | 2d3 | www.2d3.com | N/A | [Not previously reviewed in <i>3D World</i>] | N/A |
| MATCHMOVER PRO 3 | Mac/PC/Linux | Another of the old guard of desktop tracking applications, recently reduced greatly in price | £1,806* (\$3,500) | Realviz | www.realviz.com | 53 | A highly evolved version of the software, with powerful 2D and 3D tracking tools. The recent price cut brings it in line with its newer competitors | 8 |
| PFMATCH | Mac/PC | <i>PF-Track</i> 's younger sibling, offering a useful range of tracking tools at an entry-level price | £600 (\$1,160) | The Pixel Farm | www.thepixelfarm.co.uk | 57 | Great price, although only broadcast-resolution footage in AVI and QT formats is supported. Good user control in version 1.5, but no proxy-resolution tracking | 8 |
| PFTRACK 2 | Mac/PC | First of a new generation of lower-priced broadcast-quality camera tracking packages | £3,000 (\$5,801*) | The Pixel Farm | www.thepixelfarm.co.uk | 57 | Fast and robust 2D and 3D tracking, with powerful optical flow and analysis tools. Affordable, although recently undercut in price by <i>MatchMover Pro</i> | 9 |
| SYNTHEYES | PC | Astonishingly affordable new all-round tracking package, gaining good word of mouth | £180* (\$349) | Andersson Technologies LLC | www.ssonetech.com | 49 | An incredible range of tools for the price. Outperforms costlier rivals on many tasks, but workflow can feel counter-intuitive for those used to other apps | 9 |



TALKING POINT | Camera tracking on the cheap

THE PRICE of camera-tracking software has recently fallen sharply; RealViz's massive price cut of *MatchMover Pro* (from \$11,000 to \$3,500) reflects a growing trend towards lower-cost desktop tracking packages. But do its newer rivals offer value for money, or simply smaller

toolsets? Martin Southwood delves into the latest release of *MatchMover Pro* this issue, and looks at whether this reduced-price upgrade is worth choosing over considerably cheaper tools such as *boujou bullet* and *PFMatch*.

***MatchMover Pro 3.1* is reviewed on page 96**

LANDSCAPE GENERATION

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|--------------------------|--------|--|----------------|------------------|----------------------|-------|--|-------|
| BRYCE 5 | Mac/PC | The original landscape generator, now back in development after several years in limbo | £46* (\$89.95) | DIAZ Productions | bryce.daz3d.com | 16 | Often dismissed as a toy for hobbyists, <i>Bryce</i> is easy to use and renders at high quality. Good for photorealistic backgrounds, even with a slow renderer | 8 |
| MOJOWORLD 3 | Mac/PC | Unusual landscape generation app with a unique emphasis on creating entire planets | £103* (\$199) | Pandromeda | www.pandromeda.com | 60 | A unique approach to landscape generation that will divide users. Some great tools, but hard to control fine details and the interface can be frustrating | 6 |
| VUE 4 PROFESSIONAL | Mac/PC | First edition of <i>Vue</i> specifically aimed at professional effects work, soon to be updated | £206* (\$399) | e-on Software | www.e-onsoftware.com | 46 | Comprehensively redesigned for pro users. Better import/export capabilities, and expanded animation features. Some omissions, but very fast and intuitive | 8 |
| VUE 5 ESPRIT | Mac/PC | Landscape generation's current market leader: high-quality results at an affordable price | £129* (\$249) | e-on Software | www.e-onsoftware.com | 59 | Rightly the best-selling landscape generator: very realistic results, and easy to master. New GI rendering is slow, however, and still no proper animated water | 9 |
| WORLD CONSTRUCTION SET 6 | Mac/PC | Technical, but very powerful, package: well suited to tasks requiring real-world accuracy | £258* (\$500) | 3D Nature | www.3dnature.com | 13 | [Reviewed at version 5] A versatile and comprehensive landscape program, the interface is unintuitive with a steep learning curve and no simple mode | 8 |
| WORLDBUILDER GENESIS | PC | A popular alternative to the <i>Vue</i> family: more powerful than <i>Bryce</i> , less technical than <i>WC5</i> | £92* (\$179) | Digital Element | www.dgi-element.com | 57 | Beautiful end results, and fairly easy to use. Now very much optimised for <i>3ds max</i> , though, while some of the new features and the tutorials lack polish | 7 |
| WORLDBUILDER PRO 4 | PC | Higher-end edition of <i>WorldBuilder</i> , tailored to pro graphics artists rather than hobbyists | £360* (\$699) | Digital Element | www.dgi-element.com | 57 | A terrific program with many unique features, particularly for plant and water animation, and great user control over fine detail. But see reservations above | 7 |

WEB 3D AND MULTIMEDIA

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|-------------------------|---------------|--|-------------------|---------------|--------------------|-------|---|-------|
| ANARK STUDIO 2 | Mac/PC | Established authoring package for interactive 3D presentations | £510* (\$995) | Anark | www.anark.com | N/A | [Not previously reviewed in 3D World] | N/A |
| AXELEDGE 2 | Mac/PC | All-in-one authoring and online animation package, described as like Flash in 3D | £309* (\$595) | MindAvenue | www.mindavenue.com | 33 | Powerful all-round authoring package, with good animation and interaction editing tools. Import and export options much improved since version 2.0 | 8 |
| CULT3D | Varies | Free software suite for exporting 3ds max and Maya models in interactive online format | Free | Cycore | www.cycore.com | 12 | [Reviewed using the 3ds max exporter] Relatively straightforward to use, with a good range of options in the exporter. Very much more stable in recent builds | 7 |
| DIRECTOR MX 2004 | Mac/PC | De facto standard for authoring multimedia CDs/DVDs: now incorporating simple 3D tools | £809 (\$1,099) | Macromedia | www.macromedia.com | 37 | Greatly improved layout, but few new 3D tools since version 8.5. Havok physics and useful Web output tools, but programming needed for complex effects | 7 |
| QUEST3D 2.1 ENTERPRISE | PC | Real-time 3D authoring tool, also available in cheaper Lite and Professional editions | £1,035* (\$1,999) | Act-3D | www.quest3d.com | 48 | Full-featured all-round authoring app, but fairly easy to master: no programming required. Can become unmanageably cluttered on complex projects, though | 8 |
| SWIFT 3D 4 | Mac/PC | 3D to vector graphics conversion tool: one of the most regularly updated interactive 3D apps | £97* (\$189) | Electric Rain | www.swift3d.com | 56 | No major new tools, but several key usability tweaks see this 3D-to-Flash app maturing as a package. Generates simple animations quickly and painlessly | 9 |
| WIREFUSION 4 ENTERPRISE | Mac/PC/ Linux | Visual authoring tool for interactive 3D content: also available in cheaper editions | £1,195 (\$1,995) | Demicron | www.demicron.com | 56 | Straightforward all-round authoring solution: no need for programming or specialist plug-ins to view output. Slightly unorthodox, but quick to master | 8 |

OTHER TOOLS

| PRODUCT | FORMAT | DESCRIPTION | PRICE | DEVELOPER | WEBSITE | ISSUE | VERDICT | SCORE |
|-----------------------|---------------|--|-------------------|-----------------------------|-------------------------|-------|---|-------|
| 3D S.O.M. | PC | Image-based modelling software: one of the newer, less expensive additions to the market | £299 (\$582*) | Creative Dimension Software | www.3dsom.com | 43 | Requires photos of an object against a marker grid like D Sculptor or iModeler, but offers greater automation and can use uncalibrated images for texturing | 8 |
| D JOINER | PC | Photo-stitching software: less widely known than Stitcher, but suitable for many projects | £300 (\$575*) | D Vision Works | www.d-vw.com | 20 | In good hands, it does what it's meant to do. But it suffers from a lack of auto-features and poor usability. Documentation is disappointingly slim, to boot | 7 |
| D SCULPTOR 2 STANDARD | PC | Image-based modelling software: another mid-priced package, aimed at home users | £500 (\$960*) | D Vision Works | www.d-vw.com | 11 | [Reviewed at version 1] A good tool for creating 3D models from images, and cheaper than ImageModeler. Much slower and not as powerful, however | 8 |
| DEEP EXPLORATION 3.5 | PC | File-conversion software: capable of tackling a wide range of file formats, including CAD | £77* (\$149) | Right Hemisphere | www.righthemisphere.com | 45 | Well-designed model viewer, file conversion and asset-management utility. Includes basic 3D model editing tools, rendering and Shockwave output | 8 |
| FRAMEFORGE 3D STUDIO | Mac/PC | Storyboarding software: first of a new wave of apps aimed at previz and 3D storyboarding | £180* (\$349) | Innovative Software | www.frameforge3d.com | 55 | Extremely easy to use, and scales to even high-budget movies. Specialised props only available as add-on packs, though, and complex scenes can be sluggish | 9 |
| IMAGEMODELER 4 | Mac/PC | Image-based modelling software: one of the earliest desktop photogrammetry packages | £712* (\$1,380) | Realviz | www.realviz.com | 59 | Gives professional-quality results, and can cope with architectural-sized objects, but requires considerable user input. Quality also comes at a price | 7 |
| IMODELLER 3D 2.5 WEB | Mac/PC | Image-based modelling software: creates 3D models for online use, in a Java-based format | £70* (\$134*) | UZR | www.imodeller.com | 58 | Like the pro version but cheaper. With the right objects, this can produce quite impressive results. Wait until the release of version 3, which supports concavity | 6 |
| IMODELLER 3D 2.5 PRO | Mac/PC | Image-based modelling software: all-purpose app, exporting to a range of 3D file formats | £352* (\$675*) | UZR | www.imodeller.com | 58 | Impressive and more powerful than its main rival, D Sculptor, it has too many irritations. It may be easy to learn, but it's quirky and frustratingly unstable | 6 |
| NUGRAF | PC | File-conversion software: powerful, with support for batch conversion and CAD data | £256* (\$495) | Okino | www.okino.com | 21 | [Reviewed at version 4] This affordable package performs a demanding task exceptionally well and is relatively affordable. User interface is a tad dated | 8 |
| PARTICLEILLUSION 3 | Mac/PC | Particle software: generates 3D-style effects in 2D. Niche, but used on many pro projects | £206* (\$399) | Wonder touch | www.wonder-touch.com | 41 | A fast, flexible alternative to conventional 3D particle effects, and fits well into production pipelines. Would be improved by more specific forces and user control | 8 |
| POLYTRANS 4 | PC | File-conversion software: cut-down version of NuGraf. Lacks batch conversion facilities | £204* (\$395) | Okino | www.okino.com | 2 | [Reviewed at version 1] Not your everyday 3D program, but a very useful one that all 3D artists should consider. Conversion doesn't always run smoothly | 7 |
| REALFLOW 3 | Mac/PC/ Linux | Fluid-simulation software: the current market leader for realistic fluids, used in film projects | £620* (\$1,200) | Next Limit | www.nextlimit.com | 60 | Sets the benchmark for power and controllability for fluid-simulation systems, but at a price. Still some stability and UI issues, particularly in the Mac version | 7 |
| STITCHER 4.0 | Mac/PC | Photo-stitching: the leader in its field, though similar tools are now present in Photoshop | £299* (\$580) | Realviz | www.realviz.com | 50 | Incredibly powerful and versatile. Not a quick solution, but stands above the competition in quality of results, although that quality comes at a price | 7 |
| STORYVIZ | PC | Previsualisation software: the latest in a new wave of previz and storyboarding apps | £1,858* (\$3,600) | Realviz | www.realviz.com | 60 | Far more flexible and open-ended than simple storyboarding apps, and includes a timeline and keyframe animation capabilities. A serious investment, however | 8 |



CONTACT US | Have we missed anything?

THINGS CAN CHANGE very quickly in the world of 3D software. If you've spotted an error in this buyer's guide, please contact us at the email address below. However, before writing in, please bear the following points in mind:

1. All prices exclude VAT and shipping, plus any optional extra costs, such as printed manuals or maintenance contracts.
2. Asterisks denote currency conversions from a list price at the current rate of exchange when the entry was added to the buyer's guide.

3. Due to limitations of space, not all sectors of the 3D market can be covered each issue. We aim to vary our listings from month to month.
 4. Space also precludes us from listing the thousands of plug-ins currently available.
 5. The verdict column contains a synopsis of our last published review. In most cases this will refer to the current version of the software. Where this is not so, it should be clearly noted.
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ISSUE 62 DREAM MACHINE March 2005

A brand new look and more pages than ever! Recreate this cover image, learn from classics like *King Kong*, and find the best kit with our new buyers' guide and portable storage group test
ON THE DISC
JENNA 2.22 plug-in for C4D, worth \$200. Plus ZBrush and 3ds max tutorials



ISSUE 61 RISING STARS February 2005

The ten studios most likely to shake up the CG industry in 2005; rig a tentacled supervillain character in *Maya*, how The Embassy VFX created its cult Citroën 'dancing robot' ad
ON THE DISC
Full copy of *trueSpace4.3*, as sold for \$595; six Pixel Corps training videos



ISSUE 60 PIXAR POWER! January 2005

ON THE DISC
3ds max 7 (demo);
260MB of supporting
3ds max 7 tutorials



ISSUE 59 MADE IN JAPAN Christmas 2004

ON THE DISC
Bryce 4 (full); Bryce 5
(demo); Turbo Import
plug-in (full); 31 models

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TODAY PAGE 40**

studio profile

Useful info for 3D artists seeking work at key visual effects companies. Spotlighted this month: **Cinesite** A Kodak Company

BASED

London, Shepperton, Pinewood (UK)

CURRENT PROJECTS

- An American Haunting
- Charlie & the Chocolate Factory
- Harry Potter & the Goblet of Fire
- Hitchhiker's Guide to the Galaxy
- Revolver
- Sahara

HR CONTACT

Anna Privett, Cinesite Recruitment: jobs@cinesite.co.uk

URL

www.cinesite.com

TYPE OF WORK UNDERTAKEN

Visual effects for feature films and television. Services include physical model construction, photography and physical effects, as well as digital effects

NUMBER OF FULL-TIME EMPLOYEES

The total roster of staff (both full-time and freelances combined) can range between 170-270 people

TYPICAL NUMBER OF FULL-TIME RECRUITS PER YEAR

Most new artists recruited are freelance, although Cinesite does employ a core group of full-time 2D and 3D artists

LOOKING FOR USERS OF WHICH 3D SOFTWARE?

Artists experienced in *Maya* and *RenderMan*

KEY SKILLS FOR EMPLOYEES

Software knowledge, film experience, high calibre of work

ADDITIONAL DESIRABLE SKILLS FOR EMPLOYEES

RenderMan, *mental ray*, *Photoshop*, *Houdini*, C++, shader writing (SLIM) and the following skill sets: particle solutions, fluid dynamics, technical organic work

A TYPICAL EMPLOYEE AT CINESITE IS...

Talented, a team player, flexible, willing to try new approaches, personable, dedicated

CURRENTLY HIRING FOR

Cinesite is currently in discussion on several major projects for the second half of 2005. Vacancies are usually listed on our company website

MAXIMUM LENGTH OF DEMO REELS

A reel should be as long as is necessary to show the quality and diversity of the work. However, due to time pressures, it isn't advisable to submit a ten-minute reel covering only one shot, or a student project

PREFERRED FORMAT FOR DEMO REEL SUBMISSIONS

DVD is preferred but VHS is also welcomed. The submitted reel needs to be checked that it plays before it is sent



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BUSINESS END

Each issue, our panel of experts answers the legal and financial questions of freelancers and small studios. This month, we ask...

"I've delivered the goods: how do I get them to pay?"

Q I've just delivered a job to a client who hasn't paid me. Although the company advanced a small amount up front, it hasn't paid me the bulk of the fees on delivery of the work. My contacts seemed pleased with what I gave them, and there was no mention of any problems throughout my dealings with them. Now, my outside contractors need to be paid and I don't have the cash to do so. What's the solution? **LOU PHERSON, OXFORD**

A There's nothing worse than being let down on a job, particularly if you didn't even get an inkling that this was coming. Have you called your contacts? The first thing is to make contact with them. Point out that they haven't paid and that the fee is now overdue. If you have a good relationship with an individual contact, this would be the obvious person to speak to. It's possible that the company is having a bit of a cash-flow crisis itself, and just needs a bit more time to gather the funds. Don't invite criticism of your work. This is an obvious mistake when you're desperate for your money, and one that is made frequently. Avoid asking: "Were you happy?" Or: "It was OK, wasn't it?" Not only does it make you sound as though you doubt your own skills as a designer, it gives the clients the get out they're looking for if they've decided (for whatever reason) not to pay you.

If you don't have any joy speaking to your contacts, check your terms and conditions/standard agreement. Well-drafted terms will contain a clause that states that ownership of the work won't pass to the clients until they pay you in full. Therefore, if you aren't able to settle the matter with a phone call, you can drop them a polite email or letter pointing out that they aren't entitled to use the project until they've paid all the outstanding fees, as they don't actually own it. (It goes without saying that if your terms of business don't have such a clause, you ought to insert one immediately, to cover such a situation in the future.)

If that doesn't work, you can bring a claim against the clients through the courts. In the UK, if your primary motive is to recover a debt up to £5,000 in size, you can issue a claim against the clients in the Small Claims Court. There are standard court fees to pay, depending on the amount that you want to recover, and there is a limit on the amount of costs you can recover if you're successful. Prior to issuing the claim, you should give your clients a seven-day

warning letter stating that, unless they pay you in full, you'll issue proceedings against them. This might actually get them to pay anyway (you'll be surprised how the threat of court action focuses the attention of a badly behaved client). You should also send them a copy of the invoice, together with your standard terms or, if you don't have any, the email/letter in which the job was agreed. You'll need this as evidence, anyway, if you go the small claims route.

The Small Claims Court is designed for individuals and businesses to use without lawyers, but if the amount that you need to recover is £5,000 or more, this changes things. In such circumstances, you can recover your 'reasonable' costs and, therefore, you could engage a solicitor to assist you.

You might also want to add a claim of infringement of your intellectual property rights if the client goes ahead and uses the work without paying for it. Again, this is something that a lawyer can put together for you. Many firms offer a free initial consultation and it's worth exploring the full nature of your claim before you start firing off letters or issuing claims. If you're successful, you can ask the court to choose any number of methods to extract the money from the client and, again, this depends on the nature of your client. Mention this at your initial consultation. For US readers, an attorney can guide you through the specifics of the US Court system, although the principles of debt collection remain the same.

What about your contractors? Unless you specifically agreed with them that payment of their fees would be made once you got the money from your client, you're obliged to pay them. But have a chat to them and explain what's going on. Most contractors should be mindful of securing your future business and cut you some slack in order to give you time to get the money in. Finally, consider how you're paid for work from now on. Do you need more fees up front in future to cover your running costs and to pay outside contractors? Should you be more cautious with new clients? The answer is certainly: Yes.

Lee Cage is an intellectual property solicitor at leading media and entertainment firm Harbottle and Lewis LLP. He advises creative businesses on all areas of IP and IT law issues. [w] www.harbottle.com

● **OTHER RESOURCES**
The Court Service
Information on the UK's Small Claims Court
www.courtservice.gov.uk

UK/US Chambers of Commerce
Advice on key issues for small businesses
www.chamberonline.co.uk
www.uschamber.com

Design Law: Protecting and Enforcing Rights
by Margaret Briffa and Lee Gage: Lee Gage's own book on the subject, price £59.95
www.lawsociety.org.uk

● **IMPORTANT NOTE**
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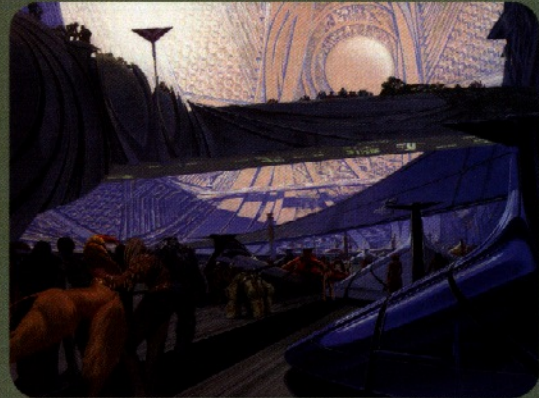
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INSPIRATIONS

Leading figures from the world of 3D discuss the sources of their inspiration. This month: **Alex Morris** on the work of Syd Mead



"I FIRST DISCOVERED Syd Mead's work back in 1979, when *Sentinel* was published. I didn't actually have enough money at the time to buy it, and it wasn't until 1983 before I managed to find an ex-display copy

in *Forbidden Planet* - Syd's books were quite difficult to find in the UK back then.

At the time, I hadn't really settled on architecture as a career, so I was just as interested in the engineering and transport designs. What blew me away wasn't just the images, but also the ideas that they represented: the whole process of rendering a design in an invented context was so unusual. When I realised that most of them were done in gouache, I was even more impressed.

What gives Syd's work such an iconic quality is his ability to build worlds around the objects he creates. I think that this also has something to do with the rigour of his technique: his images are not overly fussy or photorealistic, but all the visual cues are there to create a convincing reality - his economy of representation leaves the viewers to fill in the gaps, forcing them to engage with the images.

I also think that his use of colour is very inspirational. Most of the images have quite a restricted palette, but he still manages to use highly saturated colour in unusual combinations, which help to lead the eye around the image - something that's been an indirect influence on my own work, particularly for night shots.

Within the architectural community, his work has become more influential over time. I don't think many people in the UK were aware of it until *Blade Runner* was released in 1982, but most of the architects I know were impressed with the level of reality Ridley Scott achieved with Syd's designs and environments.

At the time - the '70s and early '80s - the scale of his work seemed grand and possible. Now, most people are less optimistic about our technological future. The space race is effectively over, and vast megastructures are out of fashion. But new sources of power and climate control could make all of these possible again tomorrow. The world's population is still growing, and most of the issues of city design are still developing.

I don't tend to dwell too much on the dystopian aspects of his imagery - which tend to represent individual design briefs, rather than Syd's own outlook, I think. In the case of *Blade Runner*, the idea of retrofitted technology created a whole new aesthetic, which you can see in pretty much all Japanese manga and which permeates most cyberpunk literature. Technologically, some of the design concepts in his images have been superseded or dropped, but stylistically, I think the work is timeless."

Alex Morris is a Director at architectural visualisation studio Hayes Davidson. He created signature imagery for London's Tate Modern gallery and Millennium Dome [w] www.hayesdavidson.com

● **MAIN** An iconic image of a futuristic cityscape, painted by Syd Mead in 1981. "The way he manages to hint at detail is almost impressionistic, and is very hard to mimic on a computer," says Alex Morris

● **ABOVE** Mead's work has influenced the design of Hollywood films and reached a new generation of fans in the early '80s

● **LEFT** A more recent image, collected in Syd Mead's latest book, *Sentury*. Mead's characteristic use of bold contrasting colours helps lead the viewer's eye around the image, creating a sense of visual narrative



ABOUT SYD MEAD

Born in Minnesota in 1933, Syd Mead joined the advanced styling studio at the Ford Motor Company. He left to pursue a wider range of design projects, founding his own company in 1970. Responsible for a series of landmark images, from his promotional work for US Steel in the '60s to concept design on *Blade Runner*, *TRON* and *Aliens*, his work is collected in series of books and training DVDs available from the website below. [w] www.sydmead.com

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Turn to page 54 to follow Mike de la Flor's tutorial familiarising you with *Mimic 2 Standard*, then turn to page 56 for a reader offer entitling you to 30% off the latest version of *Mimic Pro* for Poser and LightWave.

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SYSTEM REQ

PC: Poser 3
Windows Media Player
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700MHz processor
128MB RAM

Mac: Poser 3
QuickTime
OS X
G4 500MHz processor
128MB RAM

FACTFILE

**MIMIC 2 PRO DEMO
(LIGHTWAVE)
FORMAT
PC/Mac**

SYSTEM REQ

PC: LightWave 7.5+
Windows Media Player
Win 98/2000/ME/XP
700MHz processor
128MB RAM

Mac: LightWave 7.5+
QuickTime
OS X
G4 500MHz processor
128MB RAM

USING THE CD

GETTING STARTED

On a PC, this CD should auto-run when inserted into your CD drive. If not, run 3dw.exe. To toggle autorun on and off, use the Control Panel on your computer. On a Mac, choose 3DWClassic or 3DWIOSX to suit your operating system.

USING THE INTERFACE

The disc interface requires Windows 98, Me, 2000, XP or Mac OS 8+. You'll also need an active internet connection to make full use of the interface. For best results, ensure you're using a version 3 Web browser or better.

POINTS TO NOTE

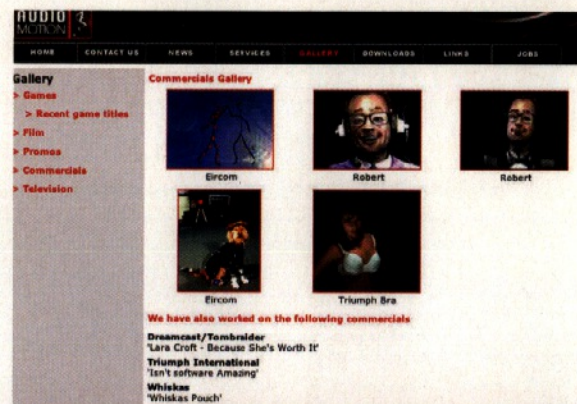
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- Some software may not be available in all territories
- Values quoted are the original prices for which the software was sold (including packaging and manuals).

Michael 3.0 and Victoria 3.0

PC/MAC DAZ Productions' famous figures, free to use in your projects

MICHAEL AND VICTORIA, developed by DAZ Productions, are superstars in the thriving Poser community. On this CD, we have version 3.0 of both of these virtual celebrities, for free! Visit www.daz3d.com for props, motions, poses, extras and a range of other resources.

www.daz3d.com



Audiomotion mo-cap files

WORTH \$500 Employ these six professional facial motion-capture files in your animations

FACIAL MOTION CAPTURE is notoriously hard to perfect, but for this CD, the staff at Audiomotion show you how it's done. On the CD is a selection of six motion-captured facial animations in C3D format suitable for use in *MotionBuilder* or *famous3D*. The files come with associated WAV audio files, and include such treasures as an excerpt of President Nixon's resignation speech.

www.audiomotion.com



FULL CD CONTENTS | What's on the 3D World disc this issue



BONUS TUTORIALS

LIGHTWAVE 8 TECHNIQUES

Three videos taken from 3D Garage's Signature Courseware for *LightWave 8*, totalling over 30 minutes of video training. The videos, which are not available anywhere online, cover the basics of gradients, volumetrics and hard linking. More training DVDs are available from the 3D Garage site, which was founded by leading artist Dan Ablan, author of the popular *Inside LightWave* books www.3dgarage.com

LEAD CONTENTS

MIMIC 2 STANDARD
MICHAEL 3.0 & VICTORIA 3.0
AUDIOMOTION MO-CAP DATA

For full details, see facing page



OTHER RESOURCES

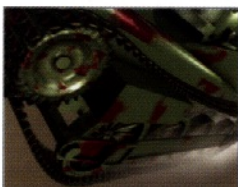
20 TEXTURES

A comprehensive selection of high-resolution, fully tiling photographic textures of walls supplied for use in your projects by Amazing Textures. These textures are licensed for commercial use www.amazingtextures.com



CD MISSING?

For a replacement, please contact your newsagent

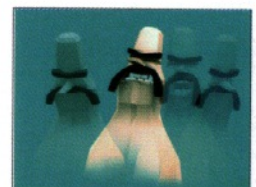


JENNA 2.22 (FULL)

A full copy of the popular plug-in suite for *Cinema 4D R9*, worth \$200. For full details, see disc interface www.corearsenal.com
Tank tracks Q&A: page 76

SUPPORTING FILES

Full-sized screenshots, project files, animations and other resources to accompany the tutorials and Q&As this issue
Magazine contents: page 4



TROUBLESHOOTING

THIS IS A FUTURE TECHNOLOGY CD-ROM. This disc has been thoroughly scanned and tested at all stages of production, but - as with all new software - we still recommend you run a virus checker before use and have an up-to-date backup of your hard drive. While every

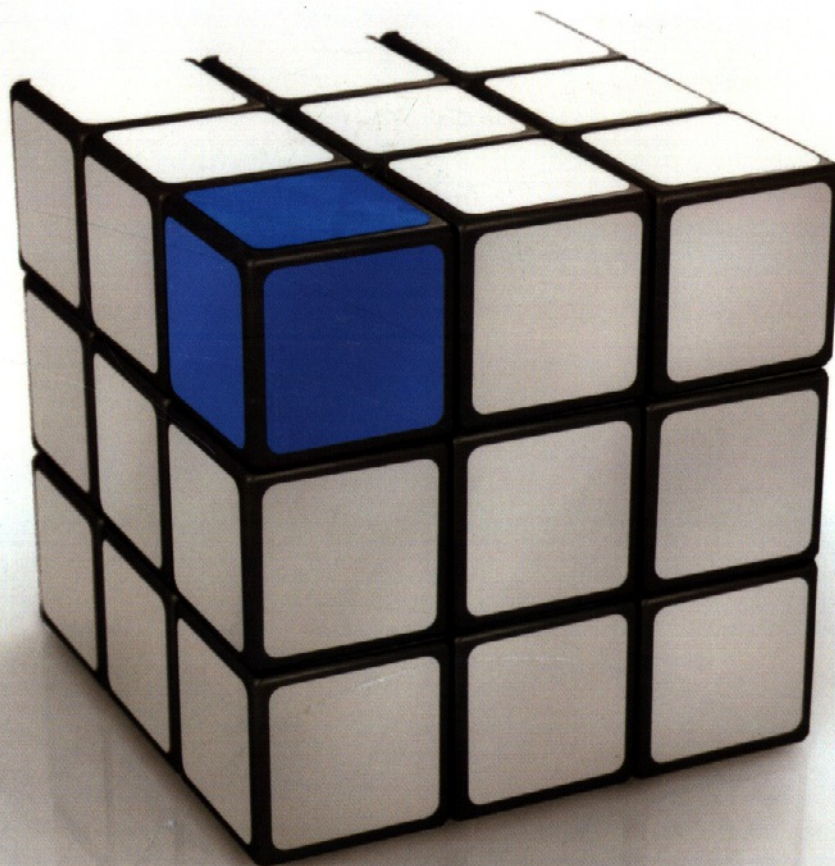
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in-depth help on the applications included on this CD, or on your hardware or operating system. For software support-related issues, please contact the relevant product's developers. We also regret that we are unable to provide serial numbers over the phone. Future Publishing can only provide technical support for this cover disc for a period of six months after this magazine's on-sale date.

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